Abstract

This PhD research started from an interest in how organisational and professional antecedents affect knowledge transfer in the professionalised context of the National Health Service. It was further motivated by findings from previous studies (Currie, Finn, & Martin, 2008a; Currie, Finn, & Martin, 2008b; Currie, Martin, & Finn, 2009; Currie & Suhomlinova, 2006a; Currie, Waring, & Finn, 2008c; Martin, Currie, & Finn, 2009; Martin, Finn, & Currie, 2007; Waring & Currie, 2009) which highlighted both the need for more contextual studies in the area of knowledge management and interesting issues around the role of professional boundaries in knowledge transfer.

This research investigates and evaluates organisational and professional antecedents to knowledge transfer in the professionalised context of the UK National Health Service, to create empirical and useful results to researchers, practitioners and policy-makers. To achieve this goal, a range of literatures were evaluated, focusing primarily on knowledge management. The review of these literatures revealed a number of research gaps from within the Knowledge Management theory to which this study responds. The two most significant gaps for this are a) a need for empirically based studies on the influence of organisational antecedents on knowledge transfer in professionalised contexts at both organisational and individuals levels and b) a need for empirically based

studies on the influence of professional antecedents on knowledge transfer in professionalised contexts at the level of the organisation and the individual.

This research is underpinned by a subjectivist ontology, an interpretive epistemology and a multi-method research design. It is exploratory, evaluative, longitidunal, comparative and inductive research with two primary data sets gathered from nurses who participated in a knowledge transfer initiative in the NHS (19 semi-structured interviews) and from key informants of the nursing profession giving their opinion on the dissemination of knowledge in the nursing profession (10 semi-structured interviews). Each data set is used to better understand the impact of organisational and professional antecedents on knowledge transfer in a professionalised context. This research project also contributed to a larger research project led by Professor Graeme Currie from the University of Nottingham aimed at evaluating NHS genetics service investments on a national scale (Martin *et al.*, 2007). This larger research project was based on a comparative analysis of organisational and professional antecedents affecting the implementation of genetic service investments. In total, 85 interviews, including that of the researcher, were conducted over a two-year period with key members of the projects such as General Practitioners, hospital consultants, scientists and nurses.

The main finding of the current study is that knowledge transfer initiatives are difficult to implement into practice when taking into the impact of a professional hierarchy on organisational mechanisms of the National Health Service. As a result, the data provide empirical evidence to suggest that KM theories are not necessarily relevant enough to a professionalised context such as the NHS.

Essentially, the study finds that existing power relationships between the medical profession and the nursing profession inhibit knowledge transfer and, as a result, poses problems for mainstreaming specialist knowledge such as genetics into generalist care settings of the NHS. In such context, knowledge transfer is influenced by professional institutions that regulate the transfer of knowledge in a profession. Therefore, the research contributes to organisation studies research by providing conceptual and empirical understanding into how organisational and professional antecedents become boundaries to knowledge transfer in a professionalised context. The study also contributes to the medical sociology literature by providing a refreshing look at the ubiquitous theme of medical dominance in healthcare systems (Armstrong, 2002; Dingwall, 1987; Dopson, 2005; Ferlie, Fitzgerald, Wood, & Hawkins, 2005; Larkin, 1978). The study finally contributes to management practice and government policy-making by providing an evaluation of knowledge management programmes in the NHS, and by making some strategic recommendations to respond to these issues.

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1 Chapter 1: Introduction

1.1 Introduction to the research project

This chapter is an introduction to a study entitled *KNOWLEDGE MANAGEMENT IN THE NATIONAL HEALTH SERVICE: An empirical study of organisational and professional antecedents to knowledge transfer in knowledge management initiatives*. It is research conducted as part of a doctoral training undertaken by the researcher at the University of Nottingham from 2004 to 2008. The study was funded by the Sociology of Health and Illness Foundation and hosted at the Institute of Science and Society research centre at the University of Nottingham which the researcher was affiliated to as a doctoral student. It is also a study that completed a larger research project led by Professor Graeme Currie from the University of Nottingham. This research team was commissioned by the Department of Health to conduct a national evaluation of organisational issues associated with the implementation of NHS genetics service investments (Martin *et al.*, 2007).

The objective of the study is to investigate, in detail, organisational and professional antecedents affecting knowledge transfer in a professionalised context. This opening chapter introduces the reader to the research through a brief discussion of some of the foundational characteristics and key findings of the study. The chapter therefore has four aims:

1. To introduce the research and to describe its key characteristics,

2. To set out the research questions and key findings,

3. To explain why Knowledge Management in the professionalised context is a distinct and promising area of study in Knowledge Management theory,

4. To provide an overview of the chapters of this thesis.

1.2 Introduction to research and key characteristics

This PhD research started from an interest in how organisational and professional antecedents affect knowledge transfer in the professionalised context of the National Health Service. It was further motivated by findings from previous studies which highlighted both the need for more contextual studies in the area of knowledge management and recent studies on the role of professions in knowledge transfer initiatives (Currie *et al.*, 2008a; Currie *et al.*, 2008b; Currie *et al.*, 2009; Currie *et al.*, 2006a; Currie *et al.*, 2008c; Martin *et al.*, 2009; Martin *et al.*, 2007; Waring *et al.*, 2009). In particular, these studies demonstrated that professions often inhibited knowledge transfer in professionalised contexts. Thus these studies highlighted a relevance gap between current knowledge management theories and the reality of professionalised contexts which, in that respect, differ from non-professionalised contexts (Tranfield & Starkey, 1998).

This research investigates and evaluates organisational and professional antecedents to knowledge transfer in the professionalised context of the UK National Health Service, to create empirical and useful results to researchers, practitioners and policy-makers. To achieve this goal, the researcher undertook a literature review of knowledge management studies and previous research

conducted within the medical sociology field. This review revealed a number of research gaps from within the Knowledge Management theory and Medical Sociology to which this study responds. The two most significant gaps for this are a) a need for empirically based studies on the role of organisational antecedents on knowledge transfer in professionalised contexts at both organisational and individuals levels and b) a need for empirically based studies on the influence of professional antecedents on knowledge transfer in professionalised contexts at the level of the organisation and the individual.

This research is underpinned by a subjectivist ontology, an interpretive epistemology and a multi-method research design. It is exploratory, longitidunal, comparative, evaluative and inductive research with two primary data sets gathered from nurses who participated in a knowledge transfer initiative in the NHS and key actors in the nursing profession who gave their impressions on the dissemination of genetic knowledge in the nursing profession. Each data set was analysed to better understand the impact of organisational and professional antecedents on knowledge transfer in a professionalised context.

The research was conducted at the Institute for Science and Society at the University of Nottingham as part of the researcher's doctoral training and a wider research project led by Professor Graeme Currie from the University of Nottingham aimed at evaluating organisational issues related to NHS genetics service investments (Martin *et al.*, 2007).

1.3 Research questions and key findings

In order to answer the research gaps briefly mentioned above, the study proposed to investigate two specific research questions:

Research question #1: How do organisational antecedents affect knowledge transfer in a professionalised context?

Research question #2: How do professional antecedents affect knowledge transfer in a professionalised context?

In relation to the first research question, the study found that even though projects delivered on their promises to help patients, organisational antecedents inhibited knowledge sharing across boundaries. Furthermore, the study found that knowledge transfer often implied self-directed learning and limited organisational support. In relation to the second research question, the study found that professional antecedents affected knowledge transfer in the nursing profession. In particular, the study found that knowledge transfer was affected by lack of resources and/or inconsistent learning strategies in the nursing profession. The study found evidence of power differentials between doctors and nurses within the knowledge management initiatives and thus contradicted the logic of these projects.

As a result, the study supported previous studies conducted within the medical sociology field and public management literature that demonstrated that professions often played a significant role in the transfer of knowledge between professions and within the NHS (Ferlie et al., 2005; Greenhalgh, Robert, Macfarlane, Bate, & Kyriakidou, 2004; Lewis & Considine, 1999; Newell & Swan, 1995; Swan & Newell, 1995; West, Barron, Dowsett, & Newton, 1999; Wood & Ferlie, 2003). In effect, the

study found that genetics knowledge was difficult to share within a nursing educational system and received little support from its professional association. In addition, the study found that client differentiation existed between nurses and the medical profession as nurses were given uninteresting and routine tasks. Thus, the study found that knowledge transfer initiatives such as those studied were of limited value for changing the long-standing professional hierarchy within the NHS. In short, doctors remained in control of the provision of genetic services and nurses were subordinated by doctors. The dissemination of genetics services was coordinated and controlled by the medical profession. At the same time, there was limited support from the nursing profession to support its member on issues related to genetics. As a result, knowledge acquired by nurses involved on the projects had limited value from a nurse perspective, especially from a career perspective. At an organisational level, the study also showed that existing organisational boundaries affected the NHS because the latter had limited mechanisms to support the transfer of knowledge from specialist areas to primary care settings. Thus, the organisation was not in a position to manage knowledge adequately. In short, knowledge was lost.

1.4 Why Knowledge Management in the professionalised context is a distinct and promising area of study in Knowledge Management theory

What makes Knowledge Management in the professionalised context a distinct area worth of study? First, this context challenges mainstream theories of Knowledge

management. These theories often assumed that knowledge was easy to transfer if managers implemented popular knowledge management programmes.

Second, it addresses a relatively new context compared to those often discussed in popular knowledge management studies. In many of the contributions of the KM literature, private-sector organisations were privileged as opposed to professionalised contexts.

Third, it challenges traditional business objectives of profitability and survival because it investigates a context where the main objective is professional dominance and not necessarily profit as often found in the knowledge management literature.

Fourth, it is an emerging and multidisciplinary research area because it involves a range of disciplines such as organisation studies, business ethics, critical management studies, public management and medical sociology to name but a few. Thus, it requires competencies from a wider range of individuals (Davies, 2003).

Fifth, because of its multi-disciplinary aspect, it can address more issues than typical knowledge management studies and provide better opportunities for researchers and practitioners to interpret organisational contexts where professions reside.

Sixth, it calls for broader lenses of analyses which often go beyond the scope of the organisation since professions operate at intra and inter-organisational levels. As a result, it requires research methods that are adapted to suit the wide range of actors typically involved in professions and multi-levels analyses (Foss, Husted, & Michailova, 2010).

Seventh, and associated to the above, this emerging research area gives voice to a new set of actors traditionally not taken into account in existing knowledge management studies. For example, the current study gives voice to nursing educators and members of nursing professional associations to address the second research question of the study.

Eighth, it is applied research area which can help academics and practitioners identify common boundaries of knowledge transfer in professionalised contexts. Therefore, it is a distinct area of study because it differs from typical knowledge management studies.

1.5 The plan of the thesis

The plan of the thesis is as follows. Chapter 2 introduces the reader to the key concepts in knowledge management theories. Chapter 3 discusses these concepts in relation to the context of the NHS. Together, these chapters will represent the literature review section of this thesis. Chapter 4 explains the research methodology used to investigate the two research questions of the study. Chapter 5 discusses findings of the study in relation to the first research question on exploring organisational antecedents to knowledge transfer in the context of the MG projects. Chapter 6 discusses findings related to the second research question on exploring professional antecedents to knowledge transfer in the context of the NHS and in the nursing profession. Chapter 7 discusses these findings within the wider literature on knowledge transfer. Chapter 8 draws implications of the study at both theoretical and

practical levels. It also discusses future research areas which could be of interest for both organisation studies researchers and medical sociologists.

2 Chapter 2: Literature review- Key Knowledge Management themes (part 1)

Chapter 2 reviews key theories and associated concepts of knowledge transfer in the knowledge management (KM) literature. This literature is vast and spans across numerous academic fields (psychology, sociology, business studies to name but a few). Thus, the objective of the chapter is to define the main themes of KM and locate the current research project within this wider academic field.

Research in knowledge management emerged in the mid-1990s and now represents a central research topic in business studies. It also had an important impact outside the academic community as governments, practitioners (i.e. managers) and popular media often refer to knowledge as being the most important asset for improving national economies (Fuller, 2001). Thus, the impact of knowledge management theory is considerable. In other words, knowledge management theories are not typical management fads such as business process re-engineering (BPR) (Gibson & Tesone, 2001). Rather, knowledge management theories are powerful and tend to encapsulate a wide range of concepts which together make knowledge management an essential field of research in business studies (Beekun, 1989; Swan & Scarbrough, 2001).

This chapter will review the knowledge management literature with a view to contradict some of the most common assumptions often held in knowledge management research. More to the point, the researcher will explain that knowledge transfer can be difficult within an organisation because of the presence of

organisational and professional boundaries, especially in professionalised contexts. To this end, the researcher will rely on recent empirical evidence suggesting the above.

The chapter is organised as follows. The first section introduces key areas of knowledge management. The second section reviews empirical evidence on knowledge transfer. A third section identifies current research gaps. A fourth section defines the main objectives of the study.

2.1 Knowledge Management key areas of research

Knowledge management research can be categorised into five essential research areas. A first category is concerned with dimensions of knowledge or how to define knowledge (Brown & Duguid, 2001). A second category is concerned with finding ways to improve organisational outcomes with knowledge (Drucker, 1991, 1993). A third category is concerned with paradoxes of knowledge management theories (Alvesson & Karreman, 2001). A fourth category is concerned with modelling Knowledge Management theoretical frameworks (Nonaka, 1991). A fifth category is concerned with testing KM theories empirically to find out whether they apply to real-world contexts or not. Each of these categories is reviewed below.

2.1.1 Dimensions of knowledge

While there are long-standing disagreements on the nature of knowledge due to ontological and epistemological differences among researchers and research traditions, there is an agreement within organisation studies research that knowledge

management can be viewed as a systematic management, use, and reuse of information, experience, and expertise to achieve a specific business benefit, goal, or objective (Alavi & Leidner, 2001; Von Krogh, 1998). It is a research topic that fascinated many researchers across a wide range of disciplines such as philosophy, sociology, psychology, information technology or economics to name but a few.

Knowledge management theory has become one of the most important research areas in organisation studies over the last fifteen years. Prior to that, the concept of knowledge was often found in economics theories or across philosophical debates if one were to go back to Plato's times. A defining moment in the knowledge management literature was Peter Drucker's concept of "knowledge worker" which placed knowledge at the forefront of the debate on ways to improve organisational performance and most importantly ways to increase profitability of industrialised economies in the wake of difficult periods of the early 1970s (Drucker, 1991, 1993).

Essentially, the field of research of knowledge management became popular for two reasons. First, it became popular among practitioners and the general public because of the underlying belief that times were changing and that knowledge was to become an important resource for organisations, society and individuals in the future. Second, it became more popular in academic circles because it represented an opportunity to tie together previous management concepts such as decentralisation, removal of middle management layers or concepts of flexibility into one single major theoretical framework (Cohen & Levinthal, 1990; Grant, 1996b; Leonardbarton, 1992; Prahalad & Hamel, 1990).

To date, the concept of knowledge management has established itself as a central research topic in the business studies literature outscoring other major movements such as business process-re-engineering (BPR), Total Quality Management or even the Industrial Revolution as one commentator remarked (Fuller, 2001). The knowledge management movement also became popular in the practitioner arena and the media culture and there are no shortage of new expressions or superlatives to refer to the omniscience and beneficence of managing knowledge in organisations and society (Alvesson *et al.*, 2001). In short, the message is that everyone should pursue knowledge to achieve individual, organisational and societal objectives.

In organisation studies, defining knowledge often depended on researchers ontological and epistemological assumptions (Dodgson, 1993a, b; Dougherty, 1992; Knights, Murray, & Willmott, 1993; Kogut & Zander, 1992, 1993; Lave & Wenger, 1991; Leonardbarton, 1992; Levinthal & March, 1993; Rappa & Debackere, 1992; Tsoukas, 1991, 1993).

Hence, there was no single definition one could use to define knowledge. Rather, one could refer to core dimensions of knowledge which are, here, more relevant for starting a discussion on what knowledge is and what it is not. Typically, defining knowledge involved three types of dimensions: tacit/explicit; local or situated/non-local; sticky/leaky knowledge.

2.1.1.1 Tacit knowledge and explicit knowledge

Tacit knowledge and explicit knowledge are central dimensions to the KM literature (Conner & Prahalad, 1996; Grant, 1997; Sanchez & Mahoney, 1996; Teece, Pisano, & Shuen, 1997). Tacit knowledge is described as knowledge difficult to transfer with words to another person or an entity. An example of such form of knowledge is the skill of riding a bike (Polanyi, 1966). While such skill can be mastered through practice, it cannot easily be expressed to someone else through verbal or written communication. Thus, tacit knowledge differs from explicit knowledge. In effect, explicit knowledge can be described as knowledge that one can express with words or knowledge that can be written in various forms (Polanyi, 1958, 1966).

Tacit and explicit dimensions are often viewed as contradictory concepts (Hall & Andriani, 2002, 2003; Hansen, Nohria, & Tierney, 1999; Hansen & von Oetinger, 2001). However, and as Polanyi originally contended, these are complementary concepts to the extent that both are necessary for one to fully achieve skilful mastery of a task (Brown *et al.*, 2001).

Having said that, it is relevant to think of tacit knowledge as more difficult to acquire than explicit knowledge because of inherent problems associated with expressing tacit knowledge through words (Brown et al., 2001; Duguid, 2005a; Tsoukas & Vladimirou, 2001). Furthermore, researchers also make a good point saying that acquiring tacit knowledge often depends on trust between people involved in the knowledge sharing process (Szulanski, 1996). Moreover, acquiring tacit knowledge is more difficult than acquiring explicit knowledge because it requires lengthy practice of a task before one could claim it has achieved a high level of a competency in performing such task. Finally, acquiring tacit knowledge is more difficult than

acquiring explicit knowledge because it may, very often, involve the presence of external parties such as individuals, groups or organisations. Said differently, one can pick up a book on software development and learn about the main areas of software development. However, the mastery of software development often depends on interactions with fellow software developers who may engage in online forums or online social networks to help novice learners. As a result, the process of acquiring tacit knowledge is often prone to interpretation from both the learner and the one sharing knowledge. Nevertheless, tacit knowledge is often regarded as an important resource for knowledge management researchers because it is considered to be unique and difficult to imitate (Conner *et al.*, 1996; Grant, 1997; Sanchez *et al.*, 1996; Teece *et al.*, 1997).

In short, it is argued that such knowledge only makes sense to those within that context (Tsoukas & Mylonopoulos, 2004). Thus, the process of transferring tacit knowledge may become difficult if not impossible to achieve given the myriad of variables that exist in different contexts. This is why tacit knowledge is viewed as an important resource for business studies researchers because it has the potential for helping organisations achieve a competitive advantage in their industry.

Overall, the dimension of tacit versus explicit knowledge is without a doubt the most popular dimension used in knowledge management studies. Its influence on other conceptualisations and definitions of knowledge is evident because these are often inspired by the idea that knowledge is not easily accessible though words.

2.1.1.2 Local, situated and bounded knowledge

A second dimension often cited in Knowledge management studies is the concept of local knowledge also referred to as situated or bounded knowledge (Tsoukas, 2002). This dimension builds upon the concept of tacit dimension of knowledge and argues that every form of knowledge base is inherently unique and dependent upon its context where such knowledge was created (Brown *et al.*, 2001; Tsoukas, 2002).

Local knowledge is often described as any social practice taking place in a specific context such as work routines used in organisational context. It is knowledge created by organisational norms, culture, structure and/or institutions. Such knowledge is regarded as difficult to transfer because of the uniqueness of the context in which such knowledge is originally created. For example, Patriotta discussed the concept of local knowledge in a study conducted in the Italian legal context and found instances where knowledge appeared to be dependent upon local circumstances or local technology, in particular the use of stenography as enabling knowledge transfer between individuals (Patriotta, 2003).

The concept of local knowledge is widely used in the KM literature as it underpins some of the most influential theories of knowledge sharing. For example, studies on communities of practice make extensive use of concepts of local and situated knowledge to posit the argument that knowledge is created and shared in specific contexts only (Lave *et al.*, 1991). Essentially, a community of practice creates and shares knowledge under certain specific conditions and rules often created by senior members of that community. Members of communities of practice are granted different roles and permissions for creating and sharing knowledge. Novices learn

from experts who, overtime, allow the former to create and share knowledge within that community. As the novice learns and is granted access to the community, more knowledge is shared to this individual who becomes more knowledgeable and more able to use this knowledge in such communitarian context. As a result, the concept of local and situated knowledge articulates the notion that every situation is different and that it ultimately influences knowledge transfer practices between individuals (Brown and Duguid, 1998; Tyre and vonHippel, 1997).

The notion of local knowledge is also an important dimension in the knowledge management literature because it helps researchers understand resistance to change in specific contexts more than other concepts in the knowledge management literature. In effect, the local dimension of knowledge is a useful heuristic for those arguing that knowledge is unique and extremely dependent upon its context where it originated. In the concept of communities of practice for example, local norms and rules dictate participation of individuals in such communities. These norms are specific to that context and attempt to change these norms may be met by resistance by members of this community. In effect, critiques of the KM literature will often argue that knowledge developed within context may be difficult to share outside this context as individuals may not willing nor able to share this knowledge. As such, the power of the concept of local knowledge lies in the opportunity for researchers to define a form of knowledge that is difficult to transport outside a specific context.

The issue of resistance or inability to move knowledge outside a specific context is also conceptualised in the sticky/leaky dimension of knowledge as explained below.

2.1.1.3 Stickiness vs. leakiness of knowledge

The extent to which knowledge is dependent to a specific context was also analysed using the concept of stickiness of knowledge (Szulanski, 1996, 2000). The stickiness of knowledge is also an important dimension often found in knowledge management studies, as well as in regional and industrial studies (Krugman, 1979; Pinch & Henry, 1999). It is also another dimension that builds upon the tacitness of knowledge (Szulanski, 1996, 2000; Szulanski, Cappetta, & Jensen, 2004; Szulanski & Jensen, 2006).

Stickiness of knowledge is best described as the propensity of a particular form of knowledge to remain within the boundaries of an organisation or other specific contexts. In other words, stickiness refers to how difficult it is for knowledge to move outside a specific context (Araujo & Novello, 2004; Iliev, 2004; Jensen & Szulanski, 2004; Mahoney & Williams, 2003; Majumdar, 2000; Rerup & Szulanski, 2004; Szulanski, 1996, 2000; Szulanski et al., 2004; Szulanski et al., 2006; Voelpel, 2006; Von Hippel, 1994, 1998).

Stickiness of knowledge occurs because of the existence of organisational and professional antecedents. These antecedents, as it will be demonstrated in section 2.2 of this chapter, are often affecting knowledge transfer within and across organisations negatively. Furthermore, stickiness of knowledge tends to affect tacit knowledge more than explicit knowledge. For example, Szulanski found that importing new organisational practices from an international context into a national organisation often failed to meet management expectations (Szulanski, 1996). The key problem, as Szulanski noted, was that knowledge transfer, especially tacit knowledge transfer,

often required trust between individuals for it to be shared and, more importantly, accepted.

At the opposite end of the spectrum is the concept of leakiness of knowledge which knowledge management studies often used to describe another dimension of knowledge. In effect, other studies found that knowledge could also leak outside the boundaries of an organisation (Almeida & Kogut, 1999; Debackere & Rappa, 1994). For example, employees leaving an organisation to work for a competitor represent an example of leaky knowledge since these employees may often possess unique skills which may pose a threat to the host organisation (Almeida *et al.*, 1999; Magnani, 2006). Thus, leakiness of knowledge tend to be portrayed as a negative outcome in the KM literature, especially at strategic or industrial levels of analyses (Pinch *et al.*, 1999). In effect, knowledge leakiness may be more damaging for organisations than for individuals, especially when competing at a national level against other organisations (Brusoni & Geuna, 2003; Gertler, 2003).

Both stickiness and leakiness of knowledge represent one of the many conundrums which the KM literature is confronted with. In effect, as it will be demonstrated at a later stage of this chapter, conflicting views co-exist in the KM literature, especially when one tries to define knowledge succinctly. In the example above, one can see that managing the stickiness of knowledge can lead to adverse effects as it creates opportunities for knowledge to leak outside the boundaries of an organisation. For example, organisations who try to protect patents or important trade secrets may be threatened by the arrival of short-term contract employees as the latter often come and go after their assignment is completed. On one hand, the organisation may be faced

with an immediate problem of leakiness of knowledge as short-term employees may be as loyal as their full-time colleagues. On the other, the organisation may be faced with stickiness of knowledge as the lack of new talent in the organisation may not help with the innovative process of this organisation. Thus, such definitional problem around the concept of knowledge has led some commentators to question its relevance and pertinence in organisation studies (Alvesson *et al.*, 2001). In effect, if knowledge is sticky yet leaky, policies for sharing such knowledge may also pose significant challenges for managers at an implementation stage.

Overall, previous studies have shown that knowledge is difficult to define. Thus, it is only possible to argue that the concept of knowledge is multifaceted and strongly dependent upon assumptions and beliefs held by those who investigate KM research issues. To date, one can find other dimensions capable of describing an attribute of knowledge such as actionable knowledge or the concept of architectural and component knowledge (Cross & Sproull, 2004; Henderson & Clark, 1990). While each of them represents influential work in the KM literature, they all seem to integrate some of the dimensions described above.

2.1.2 Why is knowledge important?

Explaining why knowledge is important represents another major research area in the KM literature. Essentially, KM theories are underpinned by a deep-seated assumption that knowledge adds value to the organisation and that it can improve organisational performance (Adler, 2001; Conner *et al.*, 1996). Thus, knowledge is viewed as an internal resource organisations need to manage. This argument is strongly inspired by

classic economics theory and strategic management theories such as Theory of the Growth of the Firm, the Resource-based view (RBV) and the Knowledge-based view (KBV) (Barney, 1991; Conner *et al.*, 1996; Grant, 1996b; Penrose, 1959; Prahalad *et al.*, 1990).

In the Theory of the Growth of the Firm, Penrose argued that organisational resources will strongly affect the performance of such organisation. Resources can be categorised as tangible or intangible. Tangible resources include financial resources, types of capital equipment, land, buildings, location or qualification of employees (Penrose, 1959). Intangible resources can be difficult to describe (Hall, 1992). However, one can include key elements such as social capital (Nahapiet & Goshal, 1998), patents, networks within a distribution channel, relationships between managers, customers or employees (Penrose, 1959). Penrose argued that adequate use of resources is vital for an organisation survival. Thus, a penrosian view would consider knowledge to be an intangible resource that can be used to improve organisational performance.

In the Resource-based view (RBV), organisational resources are also viewed as central for gaining a competitive advantage in an industry. Such resources should be, according to the literature, unique in nature and not easily replicable (Barney, 1991).
The Knowledge-based view goes further than the RBV view and argues that knowledge is the most significant resource in an organisation since it is difficult to imitate (Grant, 1996a, b; Kogut, 2000; Kogut et al., 1993; Nonaka, 1991; Spender, 1994, 1996; Spender & Grant, 1996).

Both theories view knowledge as a resource because it is developed internally and not easy to replicate. For example, organisational culture, organisational identity, routines, documents, systems and employees all represent resources capable of helping an organisation gain a competitive advantage over its competition. KBV theory is similar to RBV theory in relation to the idea of resources. However, KBV is different to RBV because of the focus on knowledge as a resource.

Overall, both RBV and KBV theories build on economic rent theories where assets are treated as investments and where return is expected on each of these investments (Amit & Schoemaker, 1993). In such context, knowledge has a value and is treated as an important resource organisations should exploit. As a result, knowledge is important to organisations because it can generate a profit and over time help achieve a monopolistic position within an industry. Therefore, the rationale is expressed purely in competitive terms. In short, there is only one goal to achieve, that of profitability for long-term survival.

2.1.3 Can knowledge be managed?

While the above represented an important research area in the KM literature almost since its inception, another important theme emerged in the late 1990s questioning the overall field of knowledge management studies. More to the point, some commentators were sceptical that knowledge could ever be managed. In their views, there was an inherent paradox around the view that knowledge could be managed. In effect, if many commentators claimed that knowledge could be managed and transferred (Grant, 1996a, b; Kogut, 2000; Kogut et al., 1993; Nonaka, 1991; Spender,

1994, 1996; Spender et al., 1996), others argued that managing knowledge was controversial and often used several arguments to support their claim (Alvesson *et al.*, 2001). First, tacit knowledge is difficult to replicate. Second, knowledge transfer is sticky because it depends on organisational and professional boundaries. Finally, knowledge transfer is difficult if lack of trust and power differentials exist between members of an organisation.

Tacit knowledge is not easy to manipulate and replicate. For instance, researchers often argued that tacit knowledge could be transformed into explicit if using appropriate techniques (Nonaka, 1991, 1992, 1994; Nonaka & Konno, 1998; Nonaka, Peltokorpi, & Tomae, 2005a; Nonaka & Takeuchi, 1995; Nonaka, Takeuchi, & Umemoto, 1996a; Nonaka & Toyama, 2002, 2005b; Nonaka, Toyama, & Konno, 2000; Nonaka, Umemoto, & Senoo, 1996b; Nonaka, von Krogh, & Voelpel, 2006). One of the techniques mentioned is based on Nonaka's model of knowledge conversion (Nonaka, 1994). This model, known as the Socialisation Externalisation Combination and Internalisation model (SECI) offers a blueprint for managers to turn tacit knowledge into explicit knowledge. It is one of most cited works in the knowledge management literature. Yet, this model was contested because of a lack of empirical evidence supporting such theoretical framework (Gourlay, 2006). For instance, such model often used only a specific context, that of Japanese corporations. As a result, commentators were not convinced that such model could be applied outside the national boundaries of Japanese corporations reputed for their differences in culture or ways of working within organisations (England, 1983; Inkpen & Dinur, 1998). Furthermore, since knowledge is not a tangible resource and since it is difficult to replicate, one can easily dismantle the previous theoretical framework using the

local knowledge argument described earlier (Lam, 2002). For example, Lam (2002) argued that the transfer of knowledge often relied on specific national mechanisms which differ from country to country. As a result, the researcher shows that knowledge transfer, especially tacit knowledge, is strongly dependent upon a context and less likely to be easy to share across organisations, and in this case countries. At the same time, the author shows that specific contexts create boundaries in which only certain forms of knowledge can be created and shared. As the author suggests, "societies with different institutional arrangements will continue to develop a variety of organisational forms and learning strategies that privilege some sectors and discourage others" (Lam, 2002, p.67).

Overall, this section of the literature is an important addition to the knowledge management literature which, all too often, held optimistic views and often neglected controversial issues around the management of knowledge described above.

2.1.4 A Knowledge Management theoretical framework

Another central theme in the KM literature is concerned with building a theoretical framework for managing knowledge, whether it is conceptualised as a resource, an interaction or a process (Alavi et al., 2001; Argote, McEvily, & Reagans, 2003). The generic model which most studies tended to rely on an antecedents/processes/outcomes sequence as illustrated below:

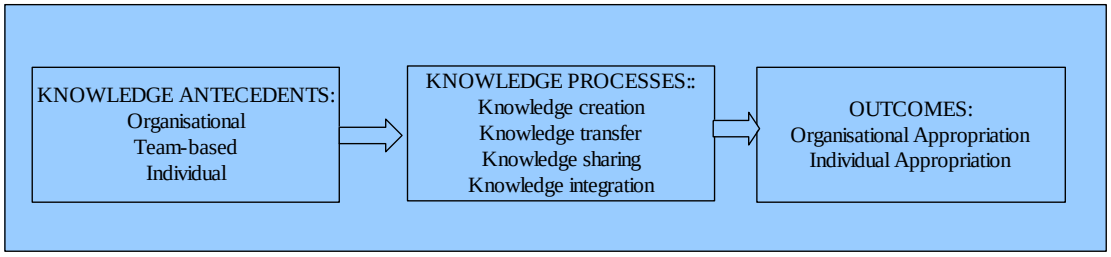


Figure 1: Modelling Knowledge Management

One area is concerned with knowledge antecedents to knowledge transfer. The second area brings strategies and techniques of knowledge transfer together. The third area is concerned with outcomes of knowledge processes.

2.1.5 Knowledge management antecedents

Knowledge antecedents are said to facilitate or inhibit knowledge transfer. The KM literature typically distinguished between three levels of antecedents: organisational, team-level and individually-based antecedents.

2.1.5.1 Organisational antecedents

First, the literature discussed organisational antecedents such as organisational culture and climate, organisational structure, corporate KM strategy, HRM and/or Information Technology.

2.1.5.1.1 Organisational culture

Culture affects knowledge transfer in organisations (Bird, Taylor, & Beechler, 1998; Brewster, 1995). In effect, many studies suggest that culture of an organisation can affect knowledge management processes in positive and/or negative ways (Currie & Kerrin, 2004; de Boer, Van den Bosch, & Volberda, 1999; Dougherty, 1992; Gherardi & Nicolini, 2002; Jensen et al., 2004; Orr, 1990b; Robertson, Scarbrough, & Swan, 2003a; Robertson & Swan, 1998, 2003b, 2004; Robertson, Swan, & Newell, 1996).

Organisational culture can be defined as a "system of […] publicly and collectively accepted meanings operating for a given at a given time" (Pettigrew, 1975, p.574). Within the KM literature, an organisational culture can facilitate knowledge if such culture supports employees in their knowledge sharing efforts. For example Gherardi and Nicolini' s ethnography study on knowledge sharing practices at a building site in Italy showed that culture played an important role in facilitating knowledge sharing of organisational safety routines, especially among newcomers. In another study, Currie and Kerrin (2004) found organisational culture to inhibit knowledge transfer. Their study on the implementation of an intranet in a UK global pharmaceutical company showed that culture could also pose a risk to knowledge sharing initiatives. In short, the researchers found that culture posed a threat to knowledge transfer because individuals were more resistant to change than anticipated.

Therefore, organisational culture can either facilitate or inhibit knowledge transfer initiatives. Studies tended to show that organisational culture facilitates when such culture facilitate exchange of information between individuals. In contrast, other studies tended to show that culture played a negative role in knowledge transfer when such culture created resistance to change. As it will be demonstrated at a later stage in

this chapter, empirical evidence on the impact of culture on knowledge transfer tends to show that knowledge is difficult to transfer in strong cultures or cultures where resistance is often encountered.

2.1.5.1.2 Organisational structure

Organisational structure plays an important role in facilitating or impeding knowledge sharing initiatives. In essence, an organisational structure is nothing more than a map or a blueprint of the various parts of an organisation (Coase, 1937; Hughes, 1937; Taylor, 1911). Key functions are grouped together to organise workflow of activities (Taylor, 1911). Hierarchies, departments, branches, workgroup, project-teams, division, virtual teams all make up an organisation's structure. The penultimate goal of an organisational structure is to meet organisational objectives (Ackroyd, 1976, 1980; Arrow, 1962; Meyer, 1995).

In the KM literature, many believed that an adequate organisational structure could facilitate knowledge transfer (Dougherty, 1992; Kogut & Zander, 1996; Liebeskind, Oliver, Zucker, & Brewer, 1996). Essentially, studies tended to argue that modern organisations needed to move away from a bureaucratic organisational structure to a flatter, more organic, and more flexible organisational structure (Ackroyd, 1995; Argyres & Silverman, 2004; Cohen et al., 1990; Hansen et al., 1999; Matusik & Heeley, 2005). For example, Dougherty (1992) found that departmental structure created different sub-cultures which, in turn, affected knowledge sharing across departments (Dougherty, 1992). Similarly, Orr's ethnographic studies at Xerox reported that knowledge transfer across departments was more difficult than

knowledge transfer within departments (Orr, 1990a; Orr, 1990b, 1996). Ackroyd (1995) found that small IT companies often benefited from a flatter organisational structure to facilitate knowledge transfer. Similarly, Argyres and Silverman found that a decentralised structure was more conducive for research and development activities than hierarchical structures (Argyres *et al.*, 2004). All of the above show that a more flexible and flatter organisational structure is preferred to the bureaucratic organisational structure because it improves interactions between employees (Smith, 1997).

Hierarchies and departments are regarded as barriers to knowledge transfer because individuals do not get opportunities to share knowledge across their organisational boundaries (Birkinshaw, Nobel, & Ridderstrale, 2002; Bloodgood & Morrow, 2003). As a result, redesigning organisational structure was often regarded as a key measure for facilitating knowledge transfer in an organisation. Redesign often involved changing existing career structures or creating project oriented or cross-functional teams (Adams, Day, & Dougherty, 1998; Quinn, 1999; Sapsed, Bessant, Partington, Tranfield, & Young, 2002). For example, studies recommended the use of pilot projects to improve new product development efforts and knowledge transfer (Adams et al., 1998). Similarly, other studies recommended that organisations change from a hierarchical organisational design to a flatter organisational design where project-based teams would become commonplace and where individuals would be reorganised around more autonomous teams with more occupations working together in teams (Adler, 2001; Argyres *et al.*, 2004; Holbeche, 1995). Finally, studies recommended that organisation use a network-based organisational design to facilitate

knowledge transfer (Reagans & McEvily, 2003). Such structure places an emphasis on loosely connected teams of individuals organised around projects.

Overall, much of the literature has often been keen on suggesting the idea that the best organisational structure for facilitating knowledge transfer is a structure with few organisational layers and more cross-functional teams.

2.1.5.1.3 Corporate KM strategy

An appropriate corporate KM strategy is also said to positively influence knowledge management processes. In particular, the literature focuses on three types of corporate KM strategies: personalisation, codification or a blended approach using both codification and personalisation strategies (Hansen et al., 1999).

Personalisation refers to strategies focusing on strong employee involvement by way of investment in training, education and development as well recruitment of top talents and superior rewards and incentives (Hansen et al., 1999). Within such strategy, the employee is an important part of the knowledge management programme and is viewed as highly knowledgeable thanks to his or her high degree of specialisation in her field. Change is often generated by the employee rather than rules used by the organisation (Arthur & Huntley, 2005). For example, a consulting firm can be viewed as using a personalisation strategy because it recruits highly skilled individuals. These individuals often participate in the decision-making process and often engage in knowledge sharing activities to solve client problems. Within this organisation, employees are often fully supported in their learning needs and can

often enjoy large degree of autonomy and financial rewards (Alvesson & Robertson, 2006; Zhao, Xu, Liu, & Ieee, 2009).

Codification of knowledge, on the other hand, refers to a strategy based on de-contextualising knowledge. Employee participation is minimal and the organisation invests in methods that centralise knowledge such as intranets or databases. Within such strategy, the focus is on rules and norms. The employee has little to contribute to in terms of changing patterns of work. Rather, the employee applies procedures repeatedly as part of his role. A typical example of such context is the call centre setting where norms and rules have more power than individuals' discretion (Callaghan & Thompson, 2002; Holtgrewe & Kerst, 2002). In such context, knowledge is centralised within databases and individuals' role is to apply this explicit knowledge with limited opportunity to alter or modify this knowledge.

For organisations willing to best manage knowledge, Hansen et al. recommended that managers choose a dominant strategy to guarantee success in managing knowledge. They also recommended that such strategy be aligned with corporate objectives and resources available to the organisation. They also claimed that the best strategy to use had to be based on an 80/20 rule. Should the organisation decide to use a personalisation strategy, then managers should spend 80% of their resources into implementing personalisation procedures and 20% implementing codification strategies. In doing so, the authors believed that organisations could improve their organisational performance alongside improving knowledge transfer in their organisations.

2.1.5.1.4 Human Resource Management (HRM)

HRM is said to play an important role in facilitating knowledge transfer. Essentially, HRM managers can influence knowledge management processes by calibrating the following HRM activities accordingly: Training and Development, Feedback mechanisms, Rewards and incentives, Recruitment and retention, Workforce planning.

HRM can support knowledge management processes by setting appropriate feedback channels between the employee and the organisation such as clear and systematic accountability processes and clear lines of authority, especially at line management levels. Evaluating employees' performance can facilitate knowledge transfer because these mechanisms can identify potential knowledge gaps in the organisation. Thus, establishing clear accountability processes are essential tools managers should not overlook. This is important both for the employee and the organisation since current skills can be identified and benchmarked against key competencies of a job (Katz and Tushman, 1983; Kim, 2003). Thus, regular and transparent performance appraisals could provide a learning route and, at the same time, generate a greater willingness to share knowledge as some commentators suggested (Blau, 1999; Granrose & Portwood, 1987). In the absence of such mechanisms, employees may not invest in learning efforts.

Clear lines of authority, especially at line management level, can also encourage knowledge transfer. In effect, this argument was supported by a number of studies (Hirsch and Jackson, 1995; Leibowitz and Schlossberg, 1981; Mayo, 1991; Renwick, 2003; Schein, 1978). The main finding was that line managers play a vital role in supporting employees in their personal career development plans and within their

existing roles. Their role was often associated with the following actions: promoting career development, spending time with staff individually on career development issues and sharing knowledge with staff (Larsen & Brewster, 2003; Yarnall, 1998). Overall, research found that feedback played a significant role in facilitating knowledge transfer.

Few studies investigated the relationship between rewards and knowledge transfer (Arthur & Kim, 2005). Yet, rewards and incentives can facilitate knowledge transfer. Rewards and incentives can be understood as a set of organisational policies aimed at compensating employees in an organisation. They can include elements such as salaries and fringe benefits such as education loans.

Appropriate rewards and incentives can facilitate affect knowledge management programmes (Cabrera, Collins, & Salgado, 2006; Deckop, Mangel, & Cirka, 1999; Nelson & Folbre, 2006). For instance, salaries tied to individual performance can motivate employees to share knowledge (Charlton & Andras, 2008; Fischer, 2004; March & Sutton, 1997; Pennings, 1993; Smith, 1984; Williams, 1999). For example, David Teece, a prominent researcher in the KM literature and founder of LEGG, a consulting organisation, used pay incentives to motivate his employees in his company so that they could share knowledge. Teece believed that transparency around issues of pay would eliminate internal politics and improve a knowledge sharing culture. In that context, employees devoted time and energy to meet these objectives.

Rewards and incentives can also affect knowledge transfer negatively if it is inappropriate to the organisational context. For example, Broschak and Davis-Blake

(2006) found that employees could experience stress and low morale if they were not paid as much as their colleagues. In their study, differences between high earners and low earners created disincentives for sharing knowledge amongst other consequences of pay differentials.

Recruitment and retention policies can also affect knowledge transfer in organisations. For example, outsourcing personnel may facilitate knowledge transfer in terms of access to a wider set of skills (Quinn, 1999; Takeishi, 2002; Teece, 2000a). In one study, Madsen et al (2003) found that building a heterogeneous workforce sourcing individuals from various educational backgrounds could facilitate knowledge transfer as these individuals were more likely to stay in the organisation on a long-term basis (Madsen, Mosakowski, & Zaheer, 2003). Similarly, studies showed that recruitment policies centred on partner similarity rather than skills were more likely to foster a context where knowledge could be shared. In other words, these studies found that recruitment based on attitude than skills were more likely to be successful for individuals to share knowledge (Callaghan *et al.*, 2002).

Retention practices are also said to be conducive for facilitating knowledge transfer in organisations. Essentially, studies suggested that knowledge is best shared in organisations where retention practices encourage individuals to stay in the organisation (Alvesson et al., 2006; Argote et al., 2003; Lee & Maurer, 1997). For example, practices encouraging close working relationships are said to promote knowledge transfer more than practices encouraging limited contact (Argote et al., 2003). Similarly, retention practices that encourage partner similarity would also improve retention rates and knowledge transfer (Darr & Kurtzberg, 2000).

Overall, recruitment and retention policies are said to facilitate knowledge transfer when it promotes a unified workforce mentality.

Workforce planning can help organisation manage individuals and knowledge to meet current and future business objectives. In that respect, organisations that place a strong emphasis on workforce planning through sourcing the right candidate and ensuring existing roles are replaced adequately are more likely to facilitate knowledge management processes in their organisation (Teece, 2000a). Similarly, organisation that successfully manage to retain what Ashworth described as a "knowledge legacy" in organisations are more likely to better manage knowledge than those who do not (Ashworth, 2006). In other words, organisations that manage to retain employees throughout their careers and those that manage the detrimental effect of a retiring workforce are more likely to facilitate knowledge transfer in their organisations (Ashworth, 2006).

Overall, studies recommended that HRM practices be configured in such a way to facilitate knowledge transfer. Essentially, these studies recommended that managers implement HRM practices that facilitate recruitment, evaluation and retention of individuals within an organisation.

2.1.5.1.5 Information technology

Information technology is also said to play an important role in facilitating knowledge management processes. In effect, IT tools such as intranets were often regarded as important tools to facilitate knowledge transfer and represented major areas of interest

for KM researchers since IT represented perhaps the most tangible process for facilitating knowledge in organisations (Alavi et al., 2001; Brusoni, Marsili, & Salter, 2005). Yet, recent empirical evidence suggested that information technology tools often failed to add value to the knowledge transfer process in organisations because culture played a significant role in knowledge creation and knowledge sharing (Alvesson et al., 2001; Newell, Scarbrough, & Swan, 2001; Newell, Swan, & Galliers, 2000). Such studies often warned managers on the use of such quick-fix solutions and often recommended a greater understanding of organisational contexts before moving onto implementing IT solutions in their organisations (Bock, Sabherwal, & Qian, 2008; Bock, Shin, Suh, & Hu, 2009; Cegarra-Navarro, Jimenez, & Martinez-Conesa, 2007).

Overall, organisational antecedents can play a role in facilitating knowledge management processes. They represent macro-level antecedents which managers can have an impact on. They also represent structural changes which are essential to create a suitable environment where knowledge is shared.

2.1.5.2 Interpersonal and team antecedents

The KM literature also discussed team and interpersonal antecedents such as team structure, coordination and facilitation of work activities amongst team members, diversity of team members, social networks and cultural characteristics. Each of these is said to facilitate knowledge transfer if well-managed.

2.1.5.2.1 Team structure

The structure of a team can affect knowledge transfer in an organisation. For example, a team built around a cross-functional design is said to be more conducive for knowledge transfer than teams built around a single speciality (Brusoni et al., 2001; Cabrera and Cabrera, 2005; Gherardi, 2000; Haas, 2006; Nonaka, 1991; 1992; 1994).

Cross-functional teams can be defined as organisational groupings of individuals spanning functional departments and hierarchies (Orlikowski, 2002). It is believed that cross-functional teams can expose individuals to other facets of their organisation which, in return, will enrich their personal knowledge and facilitate knowledge transfer among members of the cross-functional team (Brusoni, 2005; Brusoni and Prencipe, 2001; Lave and Wenger, 1991; Leonard and Sensiper, 1998).

2.1.5.2.2 Coordination and facilitation of teams

Coordination mechanisms for managing information in teams can play a positive role in knowledge transfer, be they formal or informal (Galbraith 1973; Grandori 1997). Formal coordination of teams can be described as procedures, rules, manuals or any other processes that provide teams with guidelines of tasks to be performed in organisations. Informal coordination mechanisms refer to informal procedures not recorded in organisational routines that are often based on trust and power relationships. For example, they may include informal gatherings at a canteen where individuals would often share knowledge informally about products and services. This point was highlighted in Orr's study of photocopiers engineers (Orr, 1990a; Orr, 1990b, 1996). They can also be observed at external events such as forums,

conferences and any other informal gatherings which aim at giving information to individuals from a similar industry or occupation (Bresnen, Dale, Newell, Robertson, & Swan, 1998). They can also occur on the internet whereby teams of engineers work collaboratively to create new software (Chan & Thong, 2009).

2.1.5.2.3 Diversity of team members

Studies also argued that individuals from various organisational backgrounds and various levels of expertise could contribute to knowledge transfer practices in an organisation (Adams et al., 1998; Earley & Mosakowski, 2000; El-Kot & Leat, 2005; Gersick, 1988). These studies often found that team members with various experience levels create more opportunities for learning and such variety of expertises can be of great value for an organisation than, say, a group of individuals with similar levels of expertise (Barkema & Vermeulen, 1997; Haas, 2006). For instance, Hayton and Zahra found that top managers from varied backgrounds facilitated knowledge transfer during joint ventures processes. In another study, knowledge transfer was found to be facilitated by the rich context of experiences in organisations (Kim & Miner, 2009).

2.1.5.2.4 Social networks

Studies also argued that social networks could facilitate knowledge transfer (Blair, Culkin, & Randle, 2003; Borgatti & Cross, 2003; Carroll & Teo, 1996). The oft-cited argument in the KM literature is that individuals who engage in social network activities are more likely to acquire knowledge than those who do not. This argument is inspired by the concept of weak ties (Granovetter, 1973). Essentially, the concept of

weak ties posits that individuals will learn more when they are exposed to a wider range of external networks than their work/family/social contexts (Granovetter, 1974). Studies in the KM literature also supported this idea, especially in relation to tacit knowledge (Andriani et al., 2006; Arthur et al., 2001; Balogun et al., 2005; Borgatti and Cross, 2003). Studies also argued that social networks could improve job opportunities (Granovetter, 1974; Hansen and von Oetinger, 2001; Levin and Cross, 2004; Tushman and Scanlan, 1981). Thus, social networks are seen as powerful antecedents to knowledge management processes as they provide a safe learning environment for individuals, especially for those who may no longer be employed in one organisation, such as freelancers or short-term contractors (Cross et al., 2002; Lave and Wenger, 1991; Morrison, 2002; Powell, 1990; 1998; Rappa and Debackere, 1992; Shane and Cable, 2002).

2.1.5.2.5 Cultural characteristics

The KM literature also argues that teams with members from different cultural backgrounds may be more conducive for facilitating knowledge management processes than those where cultural homogeneity exists (Haas, 2006). For example, Haas found that individuals from different backgrounds working in transnational teams were more likely to acquire technical knowledge at a faster rate than individuals with no previous experience working abroad. In the study, the author concluded that knowledge transfer could be facilitated by recruiting individuals with a rich cultural awareness.

Overall, KM studies emphasised that team-based antecedents could have a significant impact upon knowledge transfer in organisations. The following set of antecedents now discusses antecedents seldom discussed in the literature, that of individual antecedents.

2.1.5.3 Individual antecedents

Few studies investigated knowledge management from the individual perspective. This is rather surprising given that knowledge management makes little sense without individuals. As Storey and Quintas (2001) remarked:

> "It is a paradox that, while so many authorities and commentators on knowledge management (KM) have come to the conclusion that KM ultimately depends upon people, it is precisely the people (or HR) aspect that has been the most neglected in studies in this field" (Storey and Quintas, 2001, p.344).

Individual antecedents include motivational factors, perceived benefits and costs, interpersonal trust and justice, individual attitudes.

Motivational factors can be associated with concept of commitment and motivation (Hislop, 2003). The KM literature often assumed that knowledge management processes were best implemented when managers implemented adequate structural policies in their organisations (Cabrera *et al.*, 2006; de Gilder, 2003). In particular, studies argued that success of KM initiatives depended on organisational reforms more than individuals' involvement. However, such success also depends on individuals' willingness to share knowledge, if not more, because individuals must be motivated to share knowledge in some ways.

Individual perceived benefits can also facilitate knowledge transfer in organisations. For example, individuals may be more willing to share knowledge if such knowledge sharing also benefits the person who shares knowledge (Andrews & Delahaye, 2000). For example, Andrews and Delahaye (2000) found that scientists used a cost analysis because they often selected individuals to share knowledge with based on potential increasing returns in their reputational stock. Thus, studies argued that individuals were more likely to share knowledge if they could perceive benefits that will serve their interests along with organisational objectives. It is also believed that individuals would not share knowledge if their perception of benefits is overshadowed by potential costs or risks in sharing knowledge.

Notions of trust and justice can also be individual antecedents to knowledge transfer to consider in a KM discussion (Levin & Cross, 2004). For example, Prescott (2009) found that scientists in R&D departments in multinational organisations often relied upon trust to decide whether to share knowledge with others (Prescott, 2009). In another study, Dogson (1993) found that knowledge transfer in inter-organisational collaboration relationships often required trust between individuals. The study found that mutual interest often strengthened trust among individuals and this led to greater opportunities to share knowledge (Dodgson, 1993a).

The notion of justice is also viewed as enabling knowledge transfer in organisations. For example, Kim and Mauborgne argued that individuals were more likely to share their knowledge if they felt they were working in a fair environment (Kim & Mauborgne, 1998). Conversely, the authors found that individuals were more likely to hoard or protect knowledge if processes for making decisions in their workplace were

unfair. As a result, outcomes of KM initiatives were said to be mediated by procedural justice as Kim and Mauborgne referred to.

Individual attitudes such as altruism are also essential to guarantee success of knowledge management programmes (Noe, 1986). For example, Noe (1986) found that altruistic individuals were more likely to share knowledge. In particular, the authors found that newcomers with self-centred objectives were potential threats to knowledge management initiatives. As a result, the study found that individual attitudes such as altruism mediated knowledge transfer.

Overall, knowledge management processes can be influenced by organisational, group-level and individual antecedents. Each of which can play an essential role in facilitating knowledge management processes discussed below.

2.1.6 Knowledge management processes

The following section deals with knowledge management processes that received extensive attention in the KM literature: knowledge creation and knowledge transfer.

2.1.6.1 Knowledge creation

Organisational knowledge creation can be defined as:

> "…the capability of a company as a whole to create knowledge, disseminate it throughout the organization, and embody it in products, services, and systems." (Nonaka And Takeuchi, 1995, p. 3)

Knowledge creation is a key research topic in the KM literature (Nonaka, 1991; Nonaka *et al.,* 1995). Essentially, it is believed that creating knowledge improves organisational performance. In organisation studies, the concept of knowledge creation became extremely popular with Nonaka and Takeuchi work on knowledge creation. In "The Knowledge-Creating Company", Nonaka and Takeuchi reported evidence from some of the most successful knowledge creation practices found in Japanese companies. The authors suggested that North American managers often focused on explicit knowledge too much whereas the Japanese focused on tacit knowledge. To support their claim, the authors cited practices from a wide range of Japanese companies to illustrate the extent to which tacit knowledge could be turned into explicit knowledge. In their views, tacit knowledge could be transformed explicit knowledge after careful replication of practices found elsewhere. In addition, the authors claimed that knowledge creation depended on what they called a "middle-up-down" management style with middle managers playing a linking pin role between top management and employees.

In their opinions, knowledge creation was an organisational response often stimulated by a crisis situation. Such situation required in their views change within the organisation and individual involvement was essential to guarantee success since knowledge was seen as predominantly tacit. The key challenge of knowledge creation was, in their views, to turn tacit knowledge into explicit knowledge. The authors proposed a model known as the SECI model. SECI stands for Socialisation, Externalisation, Combination and Internalisation. It is a loop-based model where tacit knowledge gradually becomes explicit knowledge.

Nonaka and Takeuchi's book was a huge success and their contribution to the KM literature is undeniable. However, recent comments show little support for such

theoretical framework (Gourlay, 2006). First, the study only investigated Japanese organisations and could not be applied to other national contexts. Second, the authors had a simplistic view of knowledge transfer making their model difficult to apply in more complex organisational contexts. Third, the authors did not discuss the issue of stickiness of knowledge which, in Gourlay or Szulanski views, are omnipresent characteristics of local contexts. In short, Nonaka and Takeuchi did not consider some of the key antecedents of knowledge discussed above, namely national culture or organisational culture, norms, routines or the impact of organisational departments upon knowledge transfer. Instead, their contribution was theoretical and perhaps too optimistic.

Nevertheless, knowledge creation has fascinated many whom research topics often revolved around ways to create knowledge and how it can contribute to the innovative process of an organisation. In effect, there is a wealth of studies documenting processes or practices that are useful to creating knowledge for new products or services. In effect, one of the main assumptions in the KM literature in relation to knowledge creation is the view that creating knowledge is inherently innovative. In other words, one of the most common beliefs often held is the idea that new knowledge will help organisations create new products and new services (Chan, 2006; El Sawy, Eriksson, Raven, & Carlsson, 2001). For example, Lam (2006) examined the role of careers upon knowledge creation across universities and private-sector based organisations. In the study, the researcher found that mechanisms that supported individuals across their university careers and their involvement in private-sector based organisations were more likely to create knowledge. In return, such new knowledge was seen to help the innovation process of private-sector organisations

whilst at the same time offer more funding opportunities for future academic research (Lam, 2007).

Essentially, the key for knowledge creation was often to ensure that new knowledge could be captured and absorbed within the existing boundaries of the organisation. Thus, the absorptive capacity of the organisation represented an important research area for KM researchers with an interest in knowledge creation (Matusik et al., 2005; Zahra & George, 2002). In effect, in many of these studies, the underpinning message to take away from was that creating knowledge required specific organisational settings for allowing knowledge to be absorbed within the confines of organisations. In other words, the idea was to promote an environment where new knowledge could be explored and, at the same time, exploited. Such belief underpinned the concept of absorptive capacity which is a concept often used in discussions around creating new knowledge for improving performance through the introduction of new products or new services (Bock et al., 2009; Brusoni et al., 2005; Hayton & Zahra, 2005; Lichtenthaler, 2008, 2009; Lichtenthaler & Lichtenthaler, 2009; Matusik et al., 2005; Reagans et al., 2003; Todorova & Durisin, 2007; Wang & Zhang, 2009; Zahra et al., 2002; Zhong, Song, & Ieee, 2008).

2.1.6.2 Knowledge transfer

Knowledge transfer represents the second most common strategy discussed in the KM literature in relation knowledge management processes. This process typically implies the sharing of knowledge and skills among individuals (internal) or organisations (inter-organisational). That process can be unidirectional with one member of an

organisation sharing knowledge with another person. Or it can be multi-directional with members learning from each other (Cabrera & Cabrera, 2005; Darr, Argote, & Epple, 1995; Lazarova & Tarique, 2005; Levin et al., 2004).

Essentially, knowledge transfer in organisations can be achieved through people or computers. For example, transferring knowledge using people requires setting appropriate structural changes as discussed above. Moreover, it requires appropriate Human Resource Development strategies (HRD) such as training and development programs. The latter usually involve training, education and development (Garavan, 1997). As Garavan remarked, these three functions of HRD represent an "integrated whole with concept of learning as the glue which holds them together" (Garavan, 1997, p.39). Training can be defined as:

> "[…] a planned and systematic effort to modify or develop knowledge, skills and attitudes through learning experiences, to achieve effective performance in an activity or a range of activities (Garavan *et al.*,1995; Harrison, 1993; Reid *et al.*, 1994).

Essentially, training focuses on skills required to do a job. It is often focused on best practices of a role (Rogers, 1986). It is short-term oriented and mostly concerned with knowledge that can be applied immediately in the organisational context.

Training can be formal or informal. Formal training involves classes provided within the context of a university classroom. Informal training can be conducted within the boundaries of the organisation. It includes methods such as Sitting-Next-to-Nellie or self-directed learning. For example, an individual may learn through observing a colleague. This technique, referred to as Sitting-next-to Nellie, is useful to provide individuals with technical skills to be used in real-world contexts (McLagan, 2000).

Similarly, an individual can engage in self-directed learning. Self-directed learning is similar to Sitting-Next-to-Nellie to the extent that it involves acquiring skills to be used in a real-world context. The difference between these two concepts is that self-directed learning may or may not require external participation as with Sitting-Next-to-Nellie which, invariably, involves the feedback of another team member or colleague. That is, individuals may engage in self-directed learning by themselves without help of their colleagues, managers or any other person (Cabrera *et al.*, 2006). This type of training may also be formal as individuals may choose to attend a course or informal as the individual builds up knowledge by way of acquiring knowledge using explicit sources of knowledge such as gathering reading materials of the internet for example.

Training can be useful for a number of reasons. For example, training can be useful for new recruits. In many organisations, socialisation of new recruits often requires training. For example, newcomers are often sent to induction training courses delivered by other staff members to learn about key safety issues of their new organisation but also to learn about the culture of the organisation (Shipton, West, Dawson, Birdi, & Patterson, 2006). In other cases, training can be useful to provide up-to-date knowledge about new technology development (Lawson, Petersen, Cousins, & Handfield, 2009). In the end, training focuses on skills that can be easily applied in a context. Its impact is seen to be immediate and benefits are usually short-term oriented.

Development activities often go beyond the scope of an organisation and may be more personal than training (Benson, Finegold, & Mohrman, 2004). In effect, development activities may represent a personal quest for the employee who may be

interested in pursuing a specific career path. Development activities typically require personal investment in learning. However, some organisations may be supportive of those pursing developmental activities by providing financial or mentoring support to those willing to shape their careers. Mentoring can be described as support provided by an individual with more experience or with a similar socio-economic background to help the employee pursue their developmental activities (Hunt & Michael, 1983). Other forms of support for developmental activities may include career counselling or job training (Cherrington, 1995). Development activities are therefore long-term strategies for acquiring knowledge and often more personal than organisational oriented. As a result, development activities are less likely to be concerned with a particular role or business objectives. Nevertheless, developmental learning may be relevant to an organisation as it can improve levels of confidence and, at the same time, encourage willingness to share knowledge with others.

Finally, education can be used to support knowledge transfer (Nadler and Wiggs, 1986). It represents the most formal knowledge transfer strategy among HRD practices because it is accredited by specific educational systems. Yet, it is perhaps one of most neglected research areas in the KM literature. In effect, there is almost no major research projects conducted within the context of the KM literature on the role of education, especially higher education, on knowledge transfer or knowledge creation. Simply put, it is known whether a cohort of MBA students would be more willing to share knowledge than a cohort of non-MBA students. Similarly, it is not known whether there is value in pursuing formal education for facilitating knowledge transfer in organisation. As such, it is difficult to review the literature from this angle. At best, one can look at the sociology of education for inspiration and empirical evidence. In effect, such literature, although not being directly related to the KM

literature, can provide insights as to how knowledge transfer may be facilitated in groups and organisations. In effect, one can look at work conducted by Collins on the so-called "credential society" (Collins, 1979). In his book, Collins made a comparison between levels of degrees obtained and work available around the US. Although such study is over thirty years old, it is an interesting illustration of the idea that education may not serve its primary purposes, namely educate and offer better work opportunities. Rather, the researcher found that education was often used as a signalling social device more than an educational tool. As such, the main message of this study was that knowledge acquired through educational means may not be entirely relevant for individuals and organisations. Building upon this finding are studies which also supported the argument that education often had no specific use in real-world contexts, especially business schools (Belfield, Bullock, & Fielding, 1999; Bennis & O'Toole, 2005).

Knowledge creation and knowledge transfer represent the main processes in the KM literature. As mentioned, focusing on implementing knowledge transfer processes in an organisation may require paying attention to knowledge management antecedents. If these antecedents are taken into account and aligned with knowledge management processes, then organisations may be able achieve the expected outcomes. These outcomes are detailed in the next section.

2.1.7 Knowledge management Outcomes

Outcomes of knowledge management can be categorised into organisational and individual categories. Both outcomes received little attention in the KM literature too.

2.1.7.1 Organisational outcomes

There is limited empirical evidence on ways to measure successful knowledge management programmes in the literature. There may be reasons for such lack of empirical support. First, research was primarily concerned with crafting the KM theoretical framework and therefore did not focus on outcomes of knowledge transfer as much as expected (Foss et al., 2010). Second, empirical support is essentially new in comparison to key contributions which are dominating the current research field. Third, most of the empirical evidence tends to come from practitioners journals such as Journal of Knowledge Management as opposed to more theoretically-oriented journals such as Academy of Management review. Thus, such empirical evidence may not spread as rapidly as papers published in important journals (Tahai & Meyer, 1999). Fourth, organisations may be perhaps less willing to discuss their knowledge management outcomes with researchers who may instead rely on other outcomes to evaluate the effectiveness of knowledge management processes. The rest of the section deals with what researchers considered to be possible outcomes of effective knowledge management.

First, the literature discussed competitive advantage as a logical outcome of knowledge management programmes (Conner *et al.*, 1996; Hall, 1992). For example, Conner and Prahalad argued that a competitive advantage depended on the effective utilisation of resources of an organisation. If well-organised, organisations should be in a position to gain a competitive advantage over its competitors.

Second, successful knowledge management initiatives should lead to improved financial performance (Teece, 1998a; Wiig, 1997). For example, Wiig argued that

maintaining a balanced intellectual capital portfolio can lead to improved financial performance. In another example, Teece (1998) argued that organisations can improve their financial performance if they can develop their dynamic capabilities- defined as the ability to rapidly sensing and seizing opportunities. He added that such capabilities are likely to reside in organisations that are highly entrepreneurial, with flat hierarchies and high autonomy (Teece, 1998a).

Third, knowledge management programmes are said to increase the innovative capacity of an organisation. This outcome is often cited in the literature, particularly in Nonaka and Takeuchi work and, as mentioned above in the concept of absorptive capacity (Nonaka, 1991, 1992, 1994; Nonaka *et al.*, 1998; Nonaka *et al.*, 2005a; Nonaka *et al.*, 1995; Nonaka *et al.*, 1996a; Nonaka *et al.*, 2002, 2005b; Nonaka *et al.*, 2000; Nonaka *et al.*, 1996b; Nonaka *et al.*, 2006; Zahra *et al.*, 2002).

Fourth, knowledge management initiatives help organisations anticipate problems (Carneiro, 2000). For example, Carneiro argued that knowledge management can help managers analyse and evaluate environmental scenarios and build adequate responses to cope with such scenarios.

Fifth, knowledge management can lead to enhanced organisational knowledge (Buckley & Carter, 2000). For example, Buckley and Carter argued that knowledge management programmes can facilitate the cooperation of individual members of an organisation and, at the same time, improve organisational knowledge.

Sixth, knowledge management programmes lead to superior use of information. For example, organisations that use KM approaches can become more effective at using

information in their organisation (Carneiro, 2000). This, in turn, facilitates the acquisition of external information within the boundaries of the organisation.

Overall, possible outcomes of knowledge management are viewed in an optimistic light. There are not necessarily specific or easily quantifiable. As Darroch (2005) argued, there is no specific guidance on ways to appropriately measure the impact of knowledge management programmes. Nor there is a set of unified measures capable of providing an accurate interpretation of outcomes of knowledge management programmes. For example, Teece concluded that knowledge management effectiveness could be measured using proxy measures such the number of patents sold or exchanged after the implementation of knowledge management programmes in an organisation (Teece, 1998a).

2.1.7.2 Individual outcomes

One can also think of individual outcomes of knowledge management programmes. Such outcomes have not been extensively studied in the KM literature. However, one can find in career theory possible knowledge management outcomes, especially when investigating the boundaryless career literature. The boundaryless career is defined as:

> "Sequences of job opportunities that go beyond the boundaries of single employment settings" (Defillippi and Arthur, 1994, p.307).

In the boundaryless career literature, knowledge is said to play an important role in individual careers because it improves one's career prospects. The boundaryless career argues that workplace learning can play an essential place where individuals

can learn and improve on their career prospects. Moreover, the boundaryless career places an emphasis on tacit knowledge since it is viewed as knowledge that individuals can use to differentiate themselves on the job markets or within their organisations when moving across. As a result, researchers in the boundaryless career literature tended to recommend that individuals develop their skills in the workplace learning, regardless of whether their organisation supports them in their development plans (Arthur, 1994; Bird, 1994; Defillippi & Arthur, 1994). While such concept received substantial attention in the career theory literature, it did not have a major in a generic discussion on KM literature. Yet, this concept can help illustrate some of the main individual outcomes that knowledge management programmes can generate.

Overall, the theoretical framework of knowledge management discussed in this literature review can help understand the key themes of the KM literature in a nutshell. It is also a framework that can be used for exploring uncharted territories such as the professionalised context of the NHS. This framework will also be used in this study. The following section explores some of the main empirical evidence reported in the generic KM literature on the relevance of organisational antecedents of knowledge transfer.

2.2 Empirical evidence on the effectiveness of antecedents of KM in the KM framework

Existing empirical evidence tends to suggest that knowledge management programmes are easily prone to failure because of inadequate or conflicting

organisational and professional antecedents. These antecedents become boundaries to knowledge transfer and can significantly inhibit knowledge management programmes. Such evidence is presented below.

2.2.1 Organisational antecedents as organisational boundaries

Empirical studies found that organisational antecedents can often inhibit knowledge transfer. Typically, these studies often found the following to inhibit knowledge transfer in organisations:

- rigid organisational structure (especially departments and hierarchies)
- strong institutional culture affecting knowledge transfer
- inadequate corporate strategy
- conflicting HRM practices in the organisation
- Failure of Knowledge management IT systems

Empirical studies often found that a rigid organisational structure inhibited knowledge management processes. For instance, the KM literature reported that departments often inhibited inter-departmental knowledge transfer. Essentially, departments often created what Postrel referred to as “islands of shared knowledge”, described as knowledge contained within boundaries of departments and difficult to share across departmental boundaries (Postrel, 2002). In another study, Dougherty found that engineers in a manufacturing plant tended to be more concerned about technical issues than their research and development colleagues who often focused on design issues (Bechky, 2003; Dougherty, 1992; Dougherty & Heller, 1994). Sosa et al. (2004) also found that knowledge was not shared across employees working in two

different departments of an aircraft maker company (Sosa, Eppinger, & Rowles, 2004).

Empirical studies also found that organisational hierarchies often inhibited knowledge management programmes. In particular, findings reported that individuals were not prepared or willing to share knowledge with their hierarchy (i.e. managers and subordinates). For example, Perretti and Negro (2006) found that knowledge sharing practices were often inhibited by hierarchical mechanisms in the US film industry. In another example, Dutton et al (2002) found that individuals often engaged in selling issues- described as filtering specific information to top management- rather than report information to their managers. Filtering of information was also observed in cross-functional teams. For example, Hayes and Walsham (2000) found that employees in a pharmaceutical organisation often filtered information in cross-functional teams meetings to avoid putting their careers at risk. Therefore, empirical evidence tends to illustrate the point that rigid organisational structure can challenge knowledge management programmes since individuals may be forced to hoard knowledge or may simply be not interested in doing so.

Studies also found that corporate knowledge management strategy was often threatened by corporate financial objectives (Mitchell, Agle, & Wood, 1997). In short, evidence reported that short-term financial objectives had a negative effect in supporting knowledge management initiatives. For example, Mitchell et al. found that organisations were often focused on short-term and urgent matters to please shareholders wants more than employees needs. As a result, Mitchell et al. study showed that financial objectives were often more important than other corporate

objectives such as knowledge management though managing developmental plans of employees.

Research on HRM practices and their role in knowledge management programmes tends to be limited. As a result, it is not possible to draw a comprehensive interpretation of how and whether HRM practices play an important role in facilitating knowledge transfer. However, findings tend to indicate that organisations may not be using HRM strategies in a systematic manner and that, if found, such strategies often conflicted one with another. Therefore, such strategies may inhibit knowledge transfer. For example, empirical evidence suggests that organisation feedback is critical for effective knowledge transfer in organisations. Essentially, these studies found that lack of feedback mechanisms can inhibit knowledge transfer. Such studies also found that line management could play a significant role in facilitating knowledge transfer (Bartlett & Ghoshal, 1995; Duffield et al., 2001; Renwick, 2003; Sheehan, 2005; Yarnall, 1998). For example, Yarnall found that line managers played a significant role in supporting their subordinates in relation to career issues and acting as a mentor. What this study and other studies mentioned is that line managers are crucial linking pins between the employee and the organisation. As such, line managers are often best placed to provide key HRM functions which, otherwise, would not be offered to individuals. However, as Yarnall pointed, much of the empirical evidence on the role of line managers in supporting employees on careers tend to show that such managers are often not able to offer support to employees because of lack of time or resources. As a result, line management support appears to be often more a rhetoric than a reality as Yarnall argued (Yarnall, 1998).

In relation to training, education and development, empirical evidence also seems to support the idea that lack of organisational support may inhibit knowledge transfer. Organisations may also fail to support their employees undertaking education because it is not an important priority at a corporate level of the organisation (Mitchell *et al.*, 1997). On the other hand, organisations may also sponsor education but end up with low morale staff or higher rate of turnover if there is limited career advancement in the organisation (Benson et al., 2004).

Empirical evidence also reported that IT systems often failed to support knowledge transfer programmes (Huber, 2001; Schultze & Orlikowski, 2004). As Huber noted, information systems are often not adapted to local organisational contexts. As a result, IT systems often fail to encourage knowledge transfer (Cegarra-Navarro *et al.*, 2007; Chan *et al.*, 2009). Thus, the context of the organisation is an important aspect to take into account to facilitate knowledge transfer (Kane & Alavi, 2007).

Overall, empirical evidence noted that there were significant organisational barriers that inhibited knowledge transfer. As the above mentioned, even solutions for eroding organisational boundaries carry with them a set of problems that empirical evidence reported.

2.2.2 Interpersonal and team boundaries

Studies also reported that interpersonal and team antecedents could quickly turn into barriers to knowledge management programmes. In particular, studies found evidence of barriers for the following antecedents: team characteristics and processes,

coordination facilitation, diversity of team members, social networks and cultural characteristics.

Team characteristics can inhibit knowledge management processes. In particular, research found that diversity was not facilitating knowledge transfer. For example, Hardy et al. (2003) found that individuals from different backgrounds were not necessarily best suited for facilitating knowledge transfer in organisations. Instead, their study supported the idea that partner similarity among team members facilitated knowledge transfer as other studies also found (Darr *et al.*, 2000; Gherardi, 2000).
Similarly, other studies found that employees with limited exposure to an organisational context (expatriates or short-term contractors for instance) were less likely to acquire and share knowledge because they were considered to be outsiders to the organisation. As a result, these studies tended to illustrate the idea that individuals were more likely to share with individuals they had established longer work relationships with (Gruenfeld, Martorana, & Fan, 2000). Such finding was also supported in other studies (Zarraga & Bonache, 2005). Research also supported the idea that wealth of knowledge gained from international experience did not facilitate knowledge transfer in teams (Sapsed & Salter, 2004; Scarbrough et al., 2004). In particular, these studies noted that knowledge acquired in other national contexts were often contested and less likely to be accepted by local team members. As a result, studies highlighted that it is partner similarity rather than diversity, as the KM literature argued, that can facilitate knowledge management processes (Darr *et al.*, 2000).

Social networks were also found to be problematic for facilitating knowledge management processes in organisations. In particular, studies found that individuals were less likely to share knowledge in social networks, especially online forums (Wasko, 2005). For example, Wasko found that people contribute to forums when it improves their reputation, when they have the experience to share their knowledge online forums, and when they are structurally embedded in the network. As a result, the study highlighted that social networks do have rules just like organisations. Even more, these studies showed that sharing knowledge is not interest-free but motivated by self-interest objectives.

Research also found that different cultural values between team members could inhibit rather than facilitate knowledge transfer. In effect, these studies often found that resistance to change often affected relationships between individuals from varied cultural backgrounds. As a result, these studies noted that such individuals were often not committed to the organisation and this could potentially lead to conflict among team members (Kirkman & Shapiro, 2001; Von Glinow, Shapiro, & Brett, 2004).

Overall, empirical evidence tended to contradict some of the most common assumptions in knowledge management literature. In particular, empirical evidence tended to show that organisational antecedents often inhibited knowledge transfer more than one would expect. Such evidence also supported the view that organisations needed to ensure that organisational mechanisms are appropriate and consistent enough to facilitate knowledge transfer.

2.2.3 Individual boundaries

As mentioned earlier, research also found evidence that individual antecedents could inhibit knowledge management processes. Essentially, individuals unwilling to share knowledge can inhibit knowledge transfer in organisations. Similarly, studies found that individuals were more likely to inhibit knowledge management processes if they had no interest in doing so (Andrews *et al.*, 2000). Finally, studies found that knowledge often depended on trust and justice (Kim & Mauborgne, 1993).

Overall, knowledge transfer can be affected by organisational boundaries. The next section reflects on the KM literature and examines some of the current gaps.

2.3 Critiques of KM and Current research gaps

Having introduced and discussed the main themes of knowledge management literature and important empirical evidence on knowledge management theory, it is now a good time to reflect on the current state of affairs in the KM literature and identify current research gaps.

2.3.1 Reflecting on KM literature

The knowledge management literature can be confusing to the lay person. Yet, anyone who peruse through the KM literature can quickly understand that most studies are mostly interested at satisfying the profit motive of organisations (Fuller, 2001). In short, much is written with a view of improving financial objectives. Strangely enough, no study has provided strong empirical evidence that proves that

effective knowledge management strategies improve organisational performance or profits (Foss et al., 2010).

Meanwhile, there is a growing body of evidence suggesting that organisational boundaries are next to impossible to eradicate in an organisational context. For example, empirical evidence reported that a flatter organisational structure creates as many problems as solutions because individuals are not necessarily willing or able to share knowledge. As a result, one needs to be cautious about such optimistic claims often made in the KM literature. In particular, the lack of empirical support for many of the KM concepts discussed earlier lead to two concerns. First, one needs to be concerned about the generalisability of current KM models. Second, one needs to pay more attention to boundaries to knowledge transfer that are, perhaps, too difficult to overcome. For instance, organisational boundaries such as structure and culture can be difficult to eradicate simply because organisations require departments, hierarchies, and other structural elements to function. Without it, little or no work could be achieved.

Furthermore, organisational antecedents may conflict one with another. For instance, HRM practices can be adapted to facilitate knowledge transfer but these initiatives may potentially conflict with an existing organisational structure or an strong institutional culture (Dimaggio & Powell, 1983). Thus, there can be conflict around the kind of changes to implement in an organisation. In doing so, managers may send conflicting signals to employees who may interpret such changes as potential threats to their existing roles or careers. The end result may be increased resistance as opposed to a more conducive environment for knowledge transfer.

As a result, one can question the maturity of the KM field and whether it is a discipline worth paying attention, especially when there is limited empirical evidence on the effectiveness of KM strategies in organisations.

Overall, the researcher agrees with Foss that the KM literature has yet to move beyond theoretical considerations and macro-level analyses and invest more time and energy into empirical studies, especially in relation to professionalised contexts (Foss et al., 2010). To be more specific, the KM literature needs to address essential research gaps as described below.

2.3.2 Current research gaps

The KM literature needs to address a number of research gaps explained in this section.

First, the KM literature needs to move beyond macro levels of analyses. That is, studies often look at organisational antecedents of knowledge management programmes. Yet, sharing knowledge is often located at the individual level. So far, there has been little empirical evidence of these micro-level antecedents. One possible reason for this is that it may be out of scope for organisational researchers who may be more interested in organisational factors leading to knowledge sharing than individual factors. In effect, individual antecedents may be perhaps more relevant for sociologists and or career theorists and even psychologists rather than strategic management and organisation studies researchers (Foss et al., 2010).

Second, there is a need for more multi-level analyses of knowledge management. For example, one can investigate both individual and organisational antecedents within a

single study. These questions represent a fairly underexplored area in the knowledge sharing literature. For example, work on how explicit rewards incentives influence knowledge sharing behaviour is not fully explored in the KM literature. On one side, it is argued that such incentives may negatively affect individual behaviour and consequently negatively affect knowledge transfer (Osterloh & Frey, 2000). On the other, other studies find that explicit incentives can facilitate knowledge sharing (Michailova & Husted, 2003). In effect, Michailova and Husted study stand worlds apart from conventional findings and recommendations made in the KM literature. In much of the generic KM literature, many researchers recommended that organisations introduce more contemporary organisational structures such as a network-based structure to facilitate knowledge transfer. Similarly, research also recommended that managers implement more HRM practices centred on individual participation to facilitate knowledge transfer. Yet, Michailova and Husted (2003) find that a rigid organisational structure and strong penalties for not sharing knowledge are conducive to facilitate knowledge transfer in Russian corporations. Thus, multi-level analyses may provide more opportunities to understand organisational contexts.

Third, the literature strongly emphasised the use of HRM strategies to facilitate knowledge management processes. Yet, little is known on the subject matter from an empirical standpoint (e.g. Bechky, 2003; Dyer and Hatch, 2004, 2006; Dyer and Nobeoka, 2000; Hansen et al., 2005; Inkpen and Tsang, 2005). For example, it is not clear whether HRM practices improve knowledge transfer and if so under which context should these HRM practices be used in. Furthermore, it is not clear which HRM practices are significantly affecting knowledge transfer and which are inhibiting knowledge transfer. For example, there is room in the KM literature for investigating

questions related to the impact of recruitment and retention policies in knowledge transfer in specific contexts such as professionalised contexts. Furthermore, there is room for investigating the role of HRD practices such as training, education and development in knowledge transfer, especially in professionalised contexts.

Fourth, most studies focused on US organisations. Yet, international contexts may be of great value to the literature, especially if they contradict common assumptions of the KM literature. As explained two paragraphs earlier, Michailova and Husted (2003) found that knowledge transfer in Russian organisations was best achieved through a "command and control" approach- described as the use of strict instructions and negative sanctions for deviant behaviours in organisations- rather than typical KM strategies (Michailova *et al.*, 2003). As such, their study contradicted the general consensus around the main recommendations made in the KM literature. In short, their study contradicted the generic assumption that knowledge was best shared in organisations where individuals experienced a large degree of autonomy for making decisions and for creating and sharing knowledge.

Fifth, little is known on knowledge transfer and professionalised contexts in the current KM literature. Yet, professions represent a significant portion of a society's workforce with doctors and lawyers being a prime example. This point represents the main drive behind this research project because professions have an impact on organisations which are different than non-professionalised contexts. To best understand this statement, one needs to understand the concept of professions and its impact on knowledge as studied in the sociology of professions.

2.3.3 Professional antecedents and professional boundaries

The KM literature has not paid sufficient attention to the role of professions in knowledge transfer. Nonetheless, professions cannot be neglected because they represent an important part of a society's workforce. Their semi-permanent traits and strong institutional culture affect organisations and are, *de facto*, antecedents to knowledge management processes since they influence organisational processes, organisational structure and organisational culture.

The concept of professions is a central theme in sociology (Abbott, 1988; Auerbach, 1976; Dingwall, 1976, 1983; Freidson, 1970a, 1971b; Heinz & Laumann, 1982; Shapiro, 2002; Starr, 1982). A profession can be defined as:

> "An occupational group with some special skill" who claims a jurisdiction right over other occupations by asking "society to recognise its cognitive structure through exclusive rights"" (Abbott 1988, p.7).

A jurisdiction is described as the relationship between the profession and its activities (Abbott, 1988). Claiming jurisdiction typically involves a variety of tasks. However, it starts with three essential tasks: diagnosing, inferring and treating clients. To diagnose a problem involves classifying and categorising a problem using professional knowledge. To infer a problem implies using professional knowledge and find a solution adapted to the problem. To treat the problem means taking action based on inferences based on professional knowledge. Using the strategies described above is a start for emerging occupations pursuing a professionalisation project and willing to be regarded as a profession before the general public and the State. Nevertheless, research noted that more strategies were used by professions to claim a

professional status over other occupations, especially medicine. In effect, professions such as medicine used far more complex strategies to deter competition since other occupational groups were often in direct competition with these professions and these often used similar strategies to also claim jurisdiction rights over their competitors. In particular, three additional strategies were used to deter competition. For instance, professions can create a set of abstract knowledge in joint collaboration with universities to claim jurisdiction rights over its competitors (Dingwall, 1987; Freidson, 1970b). Similarly, professions may use such universities to create a system of credentials which would serve as a barrier to entry in the profession. In doing so, professions can distance themselves from other occupations. This process is also referred to as professional regression (Abbott, 1988).

Professions also create professional associations that act as an interface between the public and the profession. For example, the British Medical Association supports the medical profession and acts as an interface between doctors and several audiences. It acts as an interface between the State and doctors. It also acts as a representative body for all issues related to dealing with the media. A professional association also regulates access to the profession through a registration system. That is, a profession can require that all new entrants in their profession be registered on their professional board so that they could be licensed to practice. Finally, a professional association mediates knowledge to use by doctors through a strict credential system (Ferlie et al., 2005; Newell and Swan, 1995; Swan and Newell, 1995). That is, a professional association may enforce a particular form of knowledge to be used by its members by making it compulsory at registration stage. Professions also create strict career structures to prevent inter-professional mobility and regulate entry and exit points of a

profession. For example, a doctor cannot move into the profession of law without appropriate legal qualifications. Similarly, a lawyer is required to undergo medical training to enter the medical profession. As a result, professions often restrict career mobility using knowledge or access to knowledge as a condition of entry and exit in the profession.

Professions also establish boundaries with other occupations by delegating mundane tasks to other occupations, also referred to as client differentiation. In doing so, professions control other occupations because they remain in charge of interesting cases whereas other occupations are given tasks which are not threatening to powerful occupations. Such client differentiation process can also happen at an intra-professional level. With intra-professional competition comes the idea of degradation. Degradation is the process whereby work is systematically segmented from professional to non-professional status, which leads to a division of labour between "an upper, truly professional group and a lower, subordinate one" (Abbott 1988, p.128). Thus, while the profession would be concerned with interesting cases, a lower occupational group or a lower-ranked group within the same occupation becomes responsible for looking at uninteresting clients.

Taking the above into account, one can now appreciate the potential threat of professions in a discussion on knowledge transfer in organisations. At an organisational level, a professionalised context is different than a non-professionalised context. For instance, the culture of a professionalised context affects organisational culture and structure. As the next chapter will demonstrate, the organisational structure of the National Health Service has been strongly affected by the medical

professional culture. Similarly, corporate strategy in a professionalised context would perhaps need to conform to professions' right to jurisdiction. That is, corporate strategy in professionalised contexts may have little to do with organisational performance but more with strategies of professional dominance.

HRM practices may also be altered by the influence of a profession. For instance, recruitment policies in a professionalised organisation may be tied to a profession' system of credentials meaning that newcomers can only join an organisation if they have satisfied professional requirements (i.e. professional qualifications and successful registration on the profession' registration board). In addition, feedback on performance may be based on professional competencies and not necessarily on organisational goals. This would also apply to rewards and incentives which professional associations may also have a say in.

Workforce planning can also be regulated by professional associations and not the organisation as a result of the need for the profession to pursue its professionalisation project. Thus careers may be regulated by the profession and not the organisation.
Finally, information technology may require support from a professional association to be used on a daily basis. If the professional association does not advocate the use of a particular technology whether IT based or not, such technology may not be widely disseminated within the profession. In the case of medicine, the story of forceps, as studied in sociology of birth studies, represents an early treatment and fascinating example which provides support for this argument (Fox & Worts, 1999).

At a team level, a profession can have a significant impact on knowledge transfer as well. For instance, team structure can be affected by conflicting professional goals. Similarly, coordination and facilitation of teams may be regulated by client differentiation. For example, professional team members may subordinate non-professional team members by delegating routine tasks. In that context, professional team members remain firmly in control of work being carried out in the team whereas non-professional members may only have a limited role in controlling the work to be done in the team. As such, there may be limited interactions or limited opportunities for sharing knowledge.

Diversity of team members may also be of limited value since professional team members may only prefer to share knowledge with their colleagues rather than their non-professional colleagues. Newly created social networks may also have a limited impact against professional networks. For instance, team members may not engage in social networks created specifically for sharing knowledge as they already participate in professional social networks.

At an individual level, individual attitudes may be regulated by professional values which can also be in contradiction with organisational goals. In other words, individuals may be less willing to share knowledge in an organisation if it conflicts with their professional interests.

Overall, the role of a profession in a discussion on knowledge transfer should not be overlooked. Professions play an important role in facilitating knowledge transfer. Yet, little is known on such issue. Therefore, more studies need to be conducted on the role

of professions in organisational contexts. This is therefore the main objective of this research project as described in the study's objectives below.

2.4 Our study objectives

The objectives of the study are simple: to investigate the role of organisational and professional antecedents on knowledge transfer in a professionalised context.

In effect, this study is concerned with exploring knowledge transfer in the context of projects aimed at disseminating genetics knowledge to primary care healthcare professionals, i.e. nurses. In doing so, the study explores both organisational and professional boundaries that can inhibit knowledge transfer. Thus, the study extends on the current KM literature as it tries to incorporate the professional dimension to the existing theoretical framework of knowledge management described earlier. In doing so, the study will also respond to calls for more refined analyses of healthcare systems (Davies, 2003).

2.5 Chapter summary

This chapter was concerned with reviewing the current KM literature. First, the review discussed key concepts of knowledge management which are to be used for the rest of the thesis. For instance, the review focused on dimensions of knowledge. It also discussed the debate around the importance of knowledge in organisations. It then introduced a theoretical framework for understanding knowledge management processes. The framework was divided into three distinct parts: antecedents to

knowledge, knowledge management processes and outcomes of knowledge management initiatives.

Second, the review moved onto empirical studies in the KM literature. In particular, the review showed that organisational boundaries can affect knowledge transfer more than expected.

Third, the review discussed the main issues that are common across most of the KM literature. Within this, the researcher reflected on the current state of affairs in the KM literature. This was followed by an overview of key research gaps. Then, the researcher discussed the role of professions and showed some of the potential pitfalls associated with investigating a professionalised context for amending a KM theory.

Fourth, the researcher introduced the research objectives of the current study. In particular, the study will focus on exploring antecedents to knowledge management processes into a professionalised context, that of the NHS. Chapter 3 now examines the specific context of the NHS in relation to knowledge transfer.

3 Chapter 3: Literature review of Knowledge Management and the NHS

The preceding chapter reviewed and analysed the generic knowledge management concepts and empirical evidence. The general comment made was that generic knowledge management theories or concepts often lacked empirical evidence since knowledge transfer was often argued to be difficult to share in practice. Chapter 3 reviews empirical evidence associated with the specific context of the study, that of the National Health Service.

The National Health Service (NHS) is one of the largest employer of the United Kingdom with over a million employees (National Health Service, 2009). It was created in 1946 by the National Health Service Act as a policy response to inconsistent healthcare systems in the UK (Beveridge, 1942). The service was introduced on July 5th 1948 around four key principles:

> "To ensure that everybody in the country- irrespective of means, age, sex and occupation- shall have equal opportunities to benefit from the best and most up-to-date medical and allied services available. Second, to provide, for all who want it, a comprehensive service covering every branch of medical and allied activity. Third, to divorce the case of health from questions of personal means or other factors irrelevant to it, to provide the service free of charge (apart from certain possible charges in respect of appliances). Fourth, to encourage a new attitude to health- the easier obtaining of advice early, the promotion of good health rather than only the treatment of bad."(Scambler, 2003, p.210)

Since the early 1980s, UK policy-makers began a series of controversial policy reforms aimed at modernising UK public sector organisations including the NHS (Ackroyd, Hughes, & Soothill, 1989; Bovaird & Martin, 2003; Klein, 1982). These

reforms were often inspired by contemporary management theories (Klein, 1995). So, for example, many of these recent reforms often used contemporary management theories such as removal of middle management, decentralisation, team working and, as expected, theories of knowledge management. In the case of knowledge management theories, there is limited evidence on the effectiveness of the influence of such theories in the context of the NHS. However, some empirical studies reported that public sector organisations tended to be ill-prepared or less adapted to implement knowledge management theories because of the influence of organisational and professional antecedents (Rashman & Hartley, 2002; Rashman & Radnor, 2005b). This problem also applies to the professionalised context of the NHS (Robertson *et al.*, 2003a).

Chapter 3 focuses on knowledge management theories in the context of the NHS. In particular, the chapter reviews current empirical evidence on the role of organisational and professional antecedents on knowledge transfer in the professionalised context of the NHS. The chapter is organised as follows.

First, a section reviews the nature of knowledge in the NHS. Second, a section examines current organisational and professional antecedents of knowledge transfer in the NHS. Third, a section reviews existing knowledge management processes used in the NHS. Fourth, a section discusses existing research gaps and concludes on the research questions of the current study.

3.1 Nature of knowledge in the NHS

Knowledge in the NHS is mostly of a medical and scientific nature. This has three consequences in a discussion on knowledge transfer. First, medical knowledge is fragmented and dispersed across a vast array of healthcare occupations. Thus, it requires collaboration between healthcare professions for successful delivery. Second, the increasing abundance of medical knowledge makes it difficult for individuals to keep abreast of medical advances for a sustainable period of time. Third, clinical decisions are often dependent upon local context rather than purely objective medical evidence. As a result, applying medical knowledge is often left to doctors' discretion. Together, these three points imply that medical knowledge is complex and transfer of knowledge is often subject to different forces than private-sector based organisations as commonly depicted in the KM literature.

As many commentators suggested, healthcare organisations are professionalised institutions whereby different groups with specific norms, routines and values interact (Currie et al., 2006a; Dingwall, 2003; Ferlie, Hartley, & Martin, 2003; Klein, 2001). Within such organisations, collaboration across the various healthcare services is essential for effective delivery. As Paul (2006) argued, healthcare delivery is fundamentally a collaborative process where:

> "healthcare providers work together to achieve outcomes in terms of access, quality and cost that they would find difficult, if not impractical, to accomplish on their own" (Paul 2006, 144).

Thus, managing knowledge in the NHS can be highly complex and dependent upon multiple interactions between individuals, groups and institutions. As Aldred (2002) suggested, managing knowledge in the healthcare environment can be compared to knitting with thousands of strands of knotted wool; data are held across number of locations, managed by a variety of people and agencies, and stored in every

imaginable format (Aldred, 2002). A typical example of such complex collaboration can be seen in the Human Genome project which involved over 2,500 scientists and doctors from various international institutions (Nerlich, Dingwall, & Clarke, 2002).

Knowledge in healthcare systems is also highly fragmented because of the influence of professions. In short, professions mediate knowledge transfer. In some cases, professions act as a sponsor for new medical advances. In other cases, professions are barriers to dissemination of new medical advances (Currie *et al.*, 2008b; Currie *et al.*, 2006a; Dopson, 2006; Ferlie *et al.*, 2005). For instance, Ferlie *et al.* (2005) found that professional boundaries between and within professions often inhibited the spread of medical innovations within the NHS. Similarly, Currie and Suhomlinova (2006) found that knowledge sharing was hampered by professional and institutional forces. Overall, medical knowledge is dispersed across the NHS and often difficult to move from one context to another because of the existence of a professional hierarchy between professions. In short, some professions view themselves as superior to others and this issue affects the relationship between professions as well as knowledge transfer (Dingwall, 1987).

Second, medical knowledge poses a problem of assimilation for healthcare professionals. For instance, Davenport and Glaser (2002) found that the average doctor had to keep up-to-date with over 10,000 different diseases and syndromes, 3000 medications, 1100 laboratory tests, and many of the 400,000 articles added each year to the biomedical literature to be able to do her job (Davenport & Glaser, 2002). Thus, learning in the medical context is challenging and creates an enormous challenge for healthcare professionals. On one hand, there is a wealth of information

individuals can draw upon to infer and treat patients. On the other, information is difficult to retrieve and hard to integrate for individuals wanting to keep abreast of new developments in medicine (Gray & deLusignan, 1999).

Third, clinical decision-making is often based on local conditions of a context rather than pure scientific evidence. It is suggested here that healthcare professionals tend to value local and tacit knowledge more than explicit and centralised knowledge (Clarke & Wilcockson, 2002). For example, Clarke and Wilcockson argued that doctors were more likely to use local knowledge rather than knowledge held outside their context to make clinical decisions (Clarke *et al.*, 2002). Gabbay and LeMay (2004) shared similar findings on the preference for local knowledge as opposed to knowledge developed outside a particular context. Based on an ethnographic study in primary care settings in the NHS over a two-year period, the authors found that clinicians seldom used external sources of knowledge but instead relied on what the authors termed 'mind lines'- described as collectively reinforced, internalised, tacit guidelines. These mind lines were mainly based on clinicians personal experiences and interactions with opinion leaders, patients or pharmaceutical representatives (Gabbay & le May, 2004; Gabbay et al., 2003).

Overall, medical knowledge is fragmented across various institutions, ever-changing yet tied to local contexts of the NHS. In that respect, the nature of knowledge in the NHS can be perhaps more complex than knowledge found in typical private-based organisations. To best understand this statement, one needs to review current empirical evidence conducted within the context of the NHS on organisational and professional boundaries of knowledge transfer as presented below.

3.2 Organisational antecedents to KM in the NHS

For clarity purposes, the researcher used the theoretical framework described in chapter 2 (see p.31). As chapter 2 illustrated, organisational antecedents can include elements such as organisational structure, culture, strategy, HRM practices and Information Technology. They also include interpersonal and team-based antecedents and individual antecedents.

3.2.1 Culture and Structure in the NHS

As mentioned in chapter 2, culture can facilitate knowledge transfer. This statement also applies to the NHS (Bate, 2000; Kumpers, van Raak, Hardy, & Mur, 2002). Historically, the culture of the NHS was said to be strongly influenced by the medical culture (Pickstone, 2002; Pickstone & Butler, 1984). Its influence was also said to have affected the structure of the NHS since its creation (Dingwall, 1987; Klein, 2001). To date, it is no longer accurate to describe the NHS' culture as entirely dominated by doctors. Rather, it is more appropriate to describe such culture as being heavily influenced by the medical profession. In effect, it is important to add the influence of the State in shaping the culture of the NHS. Together, these cultures represent substantial antecedents to knowledge transfer. On one side, there is a medical culture which emphasises clinical autonomy and often blames policy-makers for overstepping on their jurisdictions. On the other, there is a policy-making culture which sees doctors as being too demanding and less willing to make concessions to

improve their overall organisational functioning of the NHS. In this context, there is an overall culture of blame which has become, over the years, pervasive and difficult to ignore (Waring, 2005). To support this statement, one needs to look back at the historical development of the NHS and the role doctors played in shaping much of the culture and structure of this organisation.

The NHS was initially organised around a tripartite structure, each representing a distinct branch of healthcare occupations. One branch grouped consultants and Hospital Services together. A second branch brought general practitioners (GPs), dentists, opticians and pharmacists together (Webster, 2002). Primary care represented the third branch. It included community services such as Maternity and Child Welfare clinics, health visitors, health visitors, health education, vaccination & immunisation and ambulance services together with environmental services (Webster, 2002). This organisational structure did not facilitate knowledge transfer across organisational and professional boundaries (Pickstone, 1980). Rather, it inhibited knowledge transfer across organisational and professional boundaries because of a lack of interaction between healthcare professionals. In effect, such structure was designed to respect wishes of the powerful medical association which, at that time, had a strong influence on healthcare policy. In other words, such lack of interaction between professions and branches was essentially due to political actions and strong lobbying from the medical profession seeking to maintain a monopolistic position within the UK healthcare system (Armstrong, 1979; Pickstone, 2002; Pickstone, 1995; Pickstone *et al.*, 1984). And the creation of the NHS was, without a doubt, another example of such desire to maintain a monopolistic position for a profession

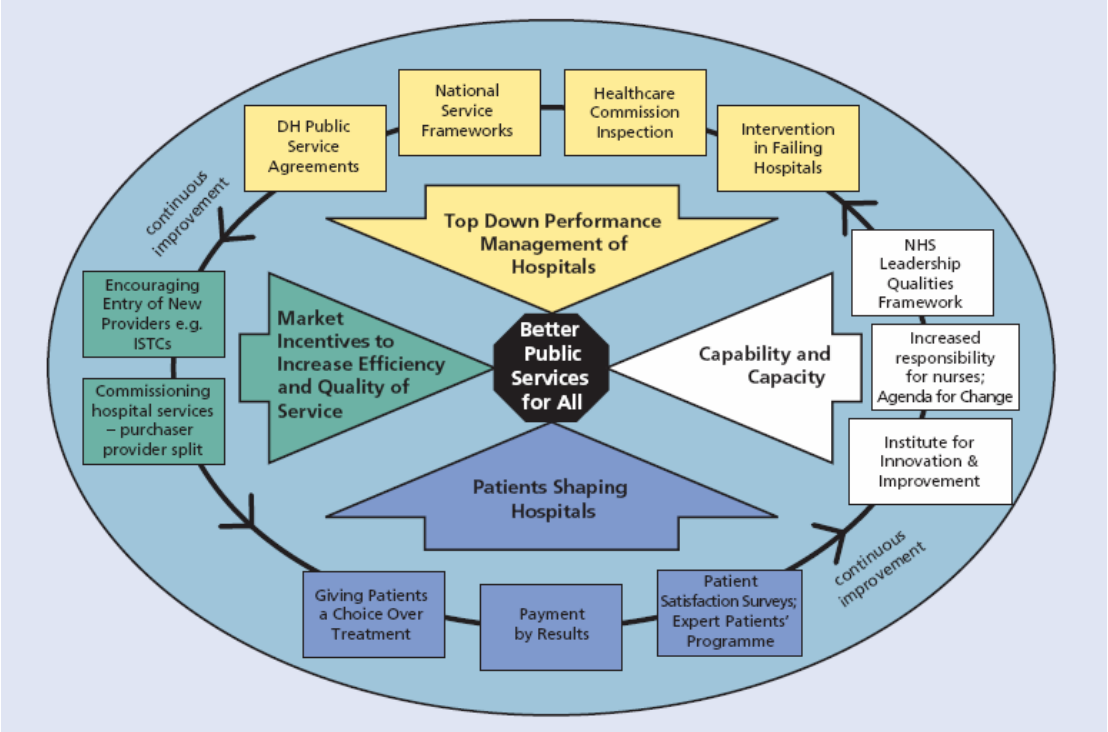
which has for long struggled to eradicate occupational competition (Freidson, 1976b; Pickstone, 1993, 2002). As Worsley put it:

> "medicine was often characterised as a profession filled with marginal men: drunken, randy medical students, half-caste army and navy surgeons; impecunious Scots with dubious medical degrees in their kilts; and irreligious professors of anatomy who furtively purchased exhumed corpses from grave-robbers…The line between the 'doctor' and the shopkeeper, at least in the eyes of the lay public, was very thin indeed." (Worsley 1997, p.203)

The creation of the NHS was therefore a success for the medical profession to the extent that doctors were able to maintain complete clinical autonomy and control over use of resources in the NHS (Larkin, 1988). As Aneurin Bevan famously commented, policy-makers, in making such compromises to doctors, had "stuffed their mouths with gold" (Foot, 1973). Among such compromises were the government willingness to let doctors dictate the organisational structure and culture of the NHS. In effect, doctors were able to control key institutions in the NHS and, at the same time, able to distance themselves from other occupations and the State. Meanwhile, policy-makers were left with managing what doctors perceived to be irrelevant issues to medical practice such as financial matters, which, over the years became a huge problem as costs kept on increasing. In short, doctors remained at the apex of the pyramid of healthcare occupations as they were able to subordinate other occupations at both organisational and professional levels. The so-called cosmology of medicine- which is here defined as the essential nature of the universe of medical discourse as a whole- favoured doctors who were still able to control the production and dissemination of organisational knowledge in the NHS (Jewson, 1976).

The hegemonic position of the medical profession persisted throughout much of the second part of the twentieth century with policy-makers consistently giving doctors more power over resources and decisions in the NHS (Klein, 1971, 1974). A prime example of such support for the medical profession was the 1962 Hospital Plan which created super hospitals in UK main cities (Pickstone, 1980; Pickstone *et al.*, 1984). With this reform, the medical profession was able to concentrate and subordinate a wide range of healthcare occupations in a single geographical space (Hodgkinson, 1967). After the Hospital Plan, some commentators argued that the medical dominance was waning and perhaps less likely to influence policy-making (Armstrong, 1976). However, empirical evidence was proving otherwise. In short, the medical profession was powerful and still in control of the NHS right up to the early 1980s (Armstrong, Fry, & Armstrong, 1991; Ferlie & Pettigrew, 1990; Harrison, 1991a; Pettigrew, McKee, & Ferlie, 1988; Strong & Robinson, 1990).

However, observers could note a U-turn in UK healthcare policy from the early 1980s and onwards with reforms centred on a so-called modernisation agenda (Powell, 2003). This “modernisation” agenda focused on four principles as pictured below.



Public services reform principles applied to the NHS (Reproduced from Cabinet Office, 2006)

As the diagram illustrates, NHS modernisation reforms focused on four areas.

First, policy reforms focused on top-down performance and the management structure of the NHS seen as inefficacious and unable to deal with day-to-day management of operations in the NHS. This point was highlighted by the famous Griffiths report (Department of Health and Social Security, 1983). In effect, if anyone was to pinpoint the origins of the modernisation agenda of the NHS, one would need to look at the Griffiths Report as its starting point. Indeed, the Griffiths Report was an important document, not so much because of its lack of lengthy analysis of the issues that inhibited the NHS, but because it represented a paradigm shift in NHS policy-making. In effect, the Griffiths Report made a series of recommendations to restructure the NHS as a response to what was perceived as an organisation with no one in charge. In effect, one of the most important observations which best captured the main problem

of the NHS was expressed in the well-known comment made by the authors of this report:

> "If Florence Nightingale were carrying her lamp through the corridors of the NHS today she would almost certainly be searching for the people in charge." (Department of Health and Social Security, 1983)

The Griffith report made key recommendations for managing the NHS, from the introduction of general management to reducing management structures at all functional levels including at a medical level (Department of Health and Social Security, 1983). For instance, the report recommended the introduction of a NHS Management Board akin to private-sector based organisations with a Managing Director controlling resources allocation in the NHS and more importantly the number of hospital beds per consultants. The role of the Managing Director also included reducing numbers and levels of staff involved in both decision making and implementation (Department of Health and Social Security, 1983). In short, the Report suggested that doctors were no longer in charge of allocating resources as they used to. In other words, there was a new management style where professional decisions such as clinical decisions of doctors and nurses were now being made by NHS executives, possibly sourced from within the NHS but also outside the NHS. In effect, the Report also supported the idea that managers in the NHS could be recruited from outside the NHS if they had relevant business acumen and expertise to manage an organisation. After all, the Griffiths Report was written by individuals who made their fortunes from large private-based organisations such as the CEO of the large supermarket food chains Sainsbury. To recap, the Griffiths Report represented one of the first U-turns in healthcare policy to the extent that it challenged medical dominance through reorganising the NHS and changing resource flows. What

followed was a stream of reforms which attempted at shifting the balance of power in the NHS.

For example, policy-makers introduced internal markets theory to control the ever-growing NHS expenses (Harrison, 1991b). Essentially, internal markets theory splits the organisation into two types of individuals: purchasers and providers. Purchasers are individuals such as general practitioners who refer patients to consultants. Providers are those who provide services ordered by purchasers. Ideally, purchasers are viewed savvy shoppers and can source services at the best value, be it based on price or skills. In this way, the expectation was that resources were to be used more efficiently as purchasers such as general practitioners were given more choices and autonomy towards making health-related decisions. To some, this emphasis on market-based mechanisms was to reduce under-performing services (Propper & Soderlund, 1998a). To others, market-based approaches did not eradicate medical dominance in the NHS (Burke & Goddard, 1990; Exworthy, 1998). Rather, some noted that some purchasers were often buying health services from providers they have been dealing with in the past (Harrison & Wistow, 1992).

Second, policy changes focused on capability and capacity by emphasising clear and transparent national standards. For example, the 1997 Labour reforms introduced new institutions and programmes such as National Service Frameworks and the National Institute for Clinical Excellence (NICE). These changes aimed at improve capacity and capability through codification of medical knowledge. In doing so, policy-makers expected healthcare services to become more transparent in the provision of healthcare services throughout the NHS. This issue of accountability became an

integral part of the change process with the publication of performance data, inspection and regulation of services in an effort to improve performance. In addition, there was an emphasis on creating an environment where leaders could flourish and where organisations could learn and become learning organisations. These ideas were strongly influenced by transformational leadership theories and the concept of the learning organisation (Department of Health, 2000, 2002).

Third, reforms placed an emphasis on competition and collaboration through broadening healthcare agencies, introduction of private sector mechanisms such as internal markets discussed above and also cooperation between healthcare providers, be they internal or external (Iliffe & Munro, 2000). For example, the 1997 reforms moved away from the competition paradigm to the collaboration paradigm and by try and blur boundaries between healthcare agencies as a response to empirical evidence showing that competition between healthcare providers had little impact on the use of resources in the NHS (Propper, Burgess, & Green, 2004; Propper, Wilson, & Soderlund, 1998b). This focus on collaboration also implied closer working relationship between private and public sector organisations as well as closer working relationships between primary care organisations and social care organisations.

Fourth, reforms encouraged user involvement by giving patients a "voice" in the shaping of public service provision by way of consultation, representation arrangement, complaint and dispute processes (Buchanan, Abbott, Bentley, Lanceley, & Meyer, 2005; Hughes & Griffiths, 1999; Propper, Wilson, & Burgess, 2006). Furthermore, patients were given more choices in terms of access to healthcare services (Carlsson, Nilbert, & Nilsson, 2006). For example, patients were then given

access to a NHS telephone line open 24/7 (Wootton et al., 1998). And outpatients services became commonplace in hospitals (Buchanan et al., 2005).

All in all, the NHS experienced tremendous changes since the early 1980s to embrace a more managerial ethos as it consistently moved towards a market-based organisation (Bate, 2000; Iliffe, 2001; Klein, 2001; Powell, 2003). Such changes were often dictated by a new ethos in public management commonly referred to as "New Public Management" (Ferlie, Ashburner, & FitzGerald, 1996). Such stance can be described as a belief that private sector management techniques can be implemented in public sector organisations such as the NHS (Iliffe, 2001; Powell, 2000).

The implications of these reforms at both structural and cultural levels are as follows. First, the modernisation reforms attempted at shifting the professional culture of the NHS by moving decision-making away from doctors to managers (Waring, 2005). The rationale behind such intent was often formulated in financial terms. In other words, many of these reforms were using the argument that doctors were not good managers and that the NHS needed to contain its escalating financial costs (McNulty & Ferlie, 2004; Propper, 2001). Such problems were also seen to hamper the core values of the NHS such as free access to healthcare services as policy-makers often argued. These reforms were also considered to be necessary because doctors were often involved in a culture of blame which had a pernicious impacts on the NHS (Reason, 2000; Waring, 2005).

Second, structural change was focused on changing an organisational structure regarded as ineffective to cope with consumer demands. In short, the argument was

that there were no incentives for healthcare providers to provide the best service to patients who, all of a sudden, became healthcare consumers and not just sick people. As a result, structural change put an emphasis upon giving patients the best care available through using every single actor (.i.e. nurses) in the NHS for providing the best service at the most affordable cost (Smith, Valsecchi, Mueller, & Gabe, 2008). It was all about value first and customers afterwards. Structural change attempted to change the NHS in two ways. At first, reforms recommended the concept of competition to implement new ways of organising work in the NHS (Kitchener, 1998; Klein, Day, & Redmayne, 1995; Maynard & Bloor, 1995; Propper, 1995). Then, reforms recommended the concept of cooperation across healthcare providers as an attempt to broaden the pool of healthcare services and allow healthcare professionals to source services from multiple healthcare organisations in an effort to provide clients with the best services available in the UK (Goddard & Mannion, 1998). In both cases, organisational structure was redesigned to adopt more contemporary organisational structures. For example, the move towards competition also implied a change in NHS organisational structure with the creation of specific institutions. Similarly, the concept of cooperation brought along new organisational structures aimed at bringing social care and primary care organisations together under the same organisational umbrella. In both cases, new organisational structures and layers of management were removed to respond to the problem of effectiveness and costs (Currie, 2000).

Therefore, structural change tried to move the NHS from a dominant medical culture to a more managerial culture (Klein, 2006). Such change in structure and culture is relevant to the current discussion on knowledge transfer to the extent that it helps

understanding the roots of the barriers to knowledge transfer from a cultural and structural standpoint. In effect, structural reforms represented attempts at blurring organisational boundaries between healthcare professionals. Such attempts were seen to promote a new culture where NHS employees would become a) more concerned about financial aspects of their organisation b) more willing to collaborate one with another.

To date, empirical studies evaluating the impact of structural reforms in the NHS often found contrasting findings. First, studies consistently noted that the medical profession still played a significant role in influencing working relationships between members of the NHS organisation (Iliffe *et al.*, 2000; Klein *et al.*, 1995; Lewis *et al.*, 1999). For instance, studies reported purchasers of healthcare services were more resistant to change than anticipated when internal markets were introduced. With the exception of general practitioners, studies found that internal markets were negatively affected by professional hierarchies and organisational differences between the different branches of the NHS (Burke *et al.*, 1990; Propper *et al.*, 1998a).

Second, studies noted that the local context often mattered more than the concept of value or cooperation the 1997 New Labour reforms were based upon (Exworthy, 1998). As Exworthy argued, doctors were more interested in using their previous working arrangements with healthcare providers than trying to cooperate within newly established organisational structures. Thus, reforms were somewhat overshadowed by a need for doctors to respect an existing professional order.

Third, medical dominance was perhaps challenged by controversial organisational reforms. Nevertheless, these reforms did not change much of the existing boundaries between professions in the NHS if one was to look at such changes from a historical standpoint (Larkin, 1978, 1988; Lewis *et al.*, 1999; Powell, 2003). The medical professional culture still prevailed and considerably influenced both structure and culture of the NHS even after modernisation agenda started (Klein, 2001).

Overall, structural reforms were not facilitating knowledge transfer because professions, especially the medical profession, often mediated structural changes in the NHS. When one compares these new contemporary organisational structures to the initial organisational structure of the NHS of 1948 and the role of the medical profession in such context, one can see almost no difference and little improvement on the relationships between professions. Rather, one can argue that structural changes were in continuity with previous reforms in the NHS. To date, organisational structure and culture of the NHS are still under the influence of the medical profession even after recent crises in the medical profession such as the Shipman case (Smith, 2002).

3.2.2 HRM practices

Studies on the role of HRM practices in the context of knowledge transfer tend to argue that HRM practices are inconsistent in the NHS (Barriball & While, 1995; Berridge, Kelly, & Gould, 2007; Currie et al., 2008a; Currie et al., 2008b; Currie et al., 2008c). Yet, as chapter 2 mentioned, HRM practices can have a positive effect on knowledge transfer.

In relation to feedback mechanisms, studies showed that there is limited consistency across the NHS organisation and that these mechanisms are often dependent upon local context (Berridge *et al.*, 2007; Currie *et al.*, 2008b). For instance, Berridge et al. (2007) found that performance appraisals were often rushed and were perceived to have limited value by managers. Their study also revealed that the goal of appraisal was often misunderstood and that there was no clear link between appraisal and opportunities for development opportunities. These findings are consistent with previous studies that suggested that performance appraisals, at least at a nursing level, were also carried inadequately (Barriball *et al.*, 1995). For instance, Barriball and While, back in 1995, found that the vast majority of nurses were not evaluated on their performances at work appraisals.

In knowledge management terms, a lack of performance appraisals can be detrimental to the organisation and the individual. Systematic appraisals are critical to provide evidence of learning and are useful for workforce planning purposes as skills get evaluated and assessed across the whole organisation (Mitchell & Flin, 2008). A lack of appraisals creates missed opportunities and can pose a threat as skills are no longer traced.

In relation to rewards and incentives, studies found limited evidence that pay facilitated knowledge transfer, especially in the nursing profession. In effect, studies appear to contradict each other on the relevance of rewards in the context of the NHS and in the context of nursing. On one side, there is an argument that using rewards does not facilitate knowledge transfer, especially in the nursing profession (Heyes, 2005). On the other, there is a counter argument that pay could become more relevant over time as the nursing profession would no longer be regarded as a preferred choice

by future students (Nelson *et al.*, 2006). Thus, these studies do not provide sufficient help for understanding the role of rewards and incentives on knowledge transfer. There is also a lack of empirical evidence on recent changes proposed by Agenda for Change on re-defining NHS pay scales (Department of Health, 2004b). Thus, it is difficult to know whether rewards and incentives such as pay could be viewed as an antecedent to facilitating knowledge transfer in the NHS.

There is also limited empirical evidence on recruitment and retention policies in the context of knowledge transfer in the NHS. Yet, recruitment and retention represent major challenges in the NHS, especially within the nursing profession (Duffield, Pallas, Aitken, Roche, & Merrick, 2006; Rondeau, Williams, & Wagar, 2008). For example, there is an ongoing shortage of nurses in the NHS and this problem is likely to continue in the future as the nursing profession is becoming increasingly unattractive for young people amongst the problems this professions face (Harvey, Hartnell, & Novicevic, 2004; Hayes et al., 2006; O'Brien-Pallas & Duffield, 2004).

In effect, recent years saw the rise of a number of issues in the nursing profession. First, there is an issue of replacing nurses retiring (Hayes et al., 2006). Second, there are fewer individuals entering the nursing profession than in the past. Linked to the second point, there are more students leaving their nursing studies than in the past (Finlayson, Dixon, Meadows, & Blair, 2002). In short, recruitment policies are not effective to compensate for the shortage of nurses. To some, this problems leads to bigger problems. In particular, the lack of staff creates more work for current staff (Finlayson et al., 2002). As a result, many become burned out long before they can retire (Janssen, de Jonge, & Bakker, 1999). This, in turn, creates a difficult

environment for individuals to find time and energy to share knowledge (Duffield, Pallas, & Aitken, 2004).

There is also limited empirical evidence on career development and knowledge transfer in the NHS. Yet, recent developments such as the introduction of competency-based Knowledge and Skills Framework (KSF) suggest that the issue of career development is being taken care of from a policy standpoint, even though it does not address retention issues such as low morale per se. nevertheless, such new reforms have implications for research on knowledge transfer.

In effect, knowledge and skills frameworks were introduced to evaluate employees' skills. It was aimed at all NHS employees except doctors as one would expect (Leggate & Russell, 2002; Lewis, Savickas, & Jones, 1996). So far, the few studies that investigated careers and knowledge transfer suggest that knowledge sharing efforts are inhibited by restriction in professional career mobility and professional values and norms (Currie, Tempest, & Starkey, 2006b). In effect, nurses, despite recent reforms aimed at blurring nursing career pathways and promote lateral career moves, are still restricted by organisational barriers and other factors such as gender perceptions to move across organisational and professional boundaries of their local contexts (Speed & Luker, 2006; Takase, Maude, & Manias, 2006; Tracey & Nicholl, 2007). For example, a nurse cannot move into a doctor's role without the appropriate training and registration requirements. As a result, despite recent changes such as the re-introduction of a modern matron or the introduction of advancing nursing practice role, there remain significant barriers between doctors and nurses (Callaghan, 2008; Currie *et al.*, 2008b).

Overall, few studies investigated the role of HRM practices in a discussion on knowledge transfer in the NHS in comparison to the generic KM literature.

3.2.3 Interpersonal and team based antecedents in the NHS

Chapter 2 argued that interpersonal and teams-based antecedents could facilitate knowledge management processes. Specifically, team characteristics and processes, coordination and facilitation mechanisms, diversity of team members, social networks and cultural characteristics were said to mediate knowledge transfer (Brusoni, 2005; Brusoni and Prencipe, 2001; Lave and Wenger, 1991; Leonard and Sensiper, 1998). In the context of the NHS, interpersonal and team based antecedents can affect knowledge transfer as well. Empirical evidence related to the above is presented below.

In terms of team characteristics, the generic KM literature claimed that individuals working in cross-functional teams were more likely to share knowledge. In the context of the NHS, this statement is not strongly empirically supported. Instead, cross-functional teams or rather intra-professional relationships were often seen as a source of conflict (Sanders & Harrison, 2008; Wanzer, Wojtaszczyk, & Kelly, 2009). For example, medical sociologists often reported a barrier between doctors and nurses working within cross-functional teams which inhibited knowledge transfer between these two professions (Carmel, 2006; Sanders *et al.*, 2008). Such findings are often absent in the generic KM literature, perhaps because few studies examined the professionalised context from an organisational perspective (Davies, 2003).

Essentially, studies found that nurses struggled to be respected by doctors (Harvey, 1995; Mackay, 1993; Porter, 1991, 1995; Stein, 1967; Stein, Watts, & Howell, 1990; Svensson, 1996; Wicks, 1998). This struggle is not a recent phenomenon according to previous studies. In effect, studies investigating the relationship between doctors and nurses often found that there nurses employed a wide range of strategies to enhance their status and occupations vis-à-vis the medical profession, often at a loss since their relationship had not changed as much as anticipated.

First, the doctor-nurse relationship was seen to be a straightforward subordination relationship whereby nurses were strictly adhering to doctors' advices and orders (Chua & Clegg, 1990). There was almost no room for negotiation between doctors and nurses. Nurses were viewed as handmaidens to the medical profession and this was accepted by both parties (Hofling, Brotzman, Dalrymple, Graves, & Pierce, 1966).

Second, studies likened the doctor-nurse relationship to a game played by both parties (Stein, 1967; Stein *et al.*, 1990). For example, Stein (1967) found that doctors and nurses were often involved in a face-saving game in relation to making clinical decisions. This 'doctor-nurse game', as Stein put it, represented a first attempt at investigating the relationship between doctors and nurses in a different way than the subordination relationship described above (Stein 1967). As Stein described:

> "The cardinal rule of the game is that open disagreement between the players must be avoided at all costs. Thus, the nurse can communicate her recommendations without appearing to be making a recommendation statement. The physician, in requesting a recommendation from a nurse, must do so without appearing to be asking for it" (Stein, 1978, p. 699)

The doctor-nurse game was thus the first study that provided a different interpretation of the relationship between doctors and nurses. However, this study, despite being one of the most cited works in the literature on medical dominance, had major empirical flaws. In effect, Stein's study consisted primarily of a transcript of a telephone conversation of less than 70 words. Thus, the research method was inappropriate and findings could have been easily contested and exaggerated. Nevertheless, Stein's impact on the topic is inestimable as it represented a stepping stone in investigating interpersonal team antecedents in the healthcare context (Darbyshire, 1987; Wright, 1985).

Third, interpersonal relationships between doctors and nurses were viewed as a negotiation process or the so-called "negotiated order" (Day & Day, 1977; Svensson, 1996). In effect, Svensson found that social order on the wards was often negotiated between doctors and nurses (Svensson 1996). In the author's view, the negotiated order was more powerful a concept than the doctor-nurse game because it highlighted the existence of structural constraints which, at times, either facilitated or inhibited the relationship between doctors and nurses. Thus, while there was an apparent constant boundary between doctors and nurses, the relationship was never crystallised. Instead this relationship was dynamic and subject to local conditions in which doctors and nurses worked. The negotiated order was also found in the UK healthcare context with studies consistently highlighting a boundary between doctors and nurses even when working in teams (Allen, 1997; Nancarrow, 2005).

In each of the examples mentioned above, participation of nurses in the clinical decision-making process was often contested or neglected when such participation

contradicted doctors clinical autonomy and decisions (Goodwin, Pope, Mort, & Smith, 2005). As a result, knowledge was difficult to share to doctors because doctors were somewhat not willing to accept nurses' recommendations. In that respect, knowledge may not be appropriated at the level of the organisation because knowledge sharing opportunities may be limited for individuals and the organisation.

As a result, both the concept of doctor-nurse game and the negotiated order are not to be underestimated in a discussion on knowledge transfer in the context of the NHS. They may not be as powerful and overt as they used to be but they still affect interpersonal relationships between doctors and nurses. For example, Finn and Waring (2006) found that the existence of a negotiated order between doctors and nurses often inhibited knowledge management processes in hospitals. Essentially, their study demonstrated that members of operating theatres, often coming from diverse occupations, were not sharing knowledge as such because of the existence of organisational objectives clashing with professional objectives (Finn & Waring, 2006). In doing so, the authors highlighted that professional knowledge developed by the medical profession often overshadowed knowledge developed in situ where team members worked. In short, a profession hierarchy existed even when doctors and nurses worked together in specific settings such as operating theatres.

The origins of the doctor nurse game or the negotiated order may be diverse and can be traced along different schools of thoughts in social sciences. For example, Marxist analyses focus on social classes as the main reason why doctors are less receptive to nurses recommendations (Sullivan, Francis, & Hegney, 2008). In such analyses, doctors are less likely to value knowledge of nurses because nurses do not share

similar socio-economic backgrounds than doctors (Chua *et al.*, 1990; Sullivan *et al.*, 2008).

Feminist analyses, on the other hand, tend to point at gender differences between doctors and nurses. Essentially, feminist theories argue that nurses are considered as handmaidens by the medical profession because most nurses, in the nursing profession, are women and not men. Therefore, the feminist argument often compared the relationship between doctors and nurses as a husband/wife relationship where wives were often confined to household chores and men more often in control of the family unit (Gamamikow, 1978). In both analyses, interpersonal relationships between doctors and nurses were seen to have deeper origins than the organisational context of the NHS or the healthcare organisation. Nevertheless, both analyses and subsequent concepts helped characterising the relationship between doctors and nurses. As a result, such interpersonal relationships have important consequences for a discussion on knowledge transfer in the NHS.

First, the professional hierarchy created by interpersonal relationships between doctors and nurses can have adverse effects for knowledge transfer. For instance, empirical studies found that nurses would not attempt to question orders from the medical profession regardless of whether such orders had life-threatening outcomes for the patient (Hofling et al., 1966). In the authors' views, the lack of questioning was explained by nurses' loyalty to doctors and their clinical judgement. In another study, Rank and Jacobson (1977) found that doctors' instructions could be contested if nurses were familiar with a drug and if they could communicate freely with their peers. If not, nurses were more likely to follow doctors' orders (Rank & Jacobson, 1977).

Second, knowledge transfer may only happen within specific context. For example, some studies found that nurses were able to dictate their relationship with doctors only in specific contexts. For instance, studies conducted in intensive care units often found nurses to be in a powerful position in their working relationship with doctors (Carmel, 2006). In such context, nurses often assumed a more dominant role because they occupied a central role in moving patients across different specialities (Manias & Street, 2001). For example, Hughes' study on doctors and nurses working in intensive care units highlights the central role of nurses in clinical decision-making. Hughes found that nurses were more powerful when three conditions were met. First, nurses were more powerful in intensive care units when admissions were too large causing chaos doctors could not cope with without the support of nurses. Second, nurses were more powerful when there was a higher turnover rate among medical staff which, in turn, created opportunities for nurses to move at the centre of the intensive care unit community because they were often more likely to stay in their roles than doctors.

Third, nurses were more powerful than medical staff when the latter was from a foreign country. In short, this study found that nurses moved closer to focal tasks of diagnosis and treatment only when they worked in specific or unique contexts (Hughes, 1988). This particular context allowed nurses to be more militant and more willing to defend their professional position and individual decision than elsewhere in the NHS. In such context, knowledge transfer was more likely to occur in both ways. That is, doctors would be sharing knowledge with nurses who would also be engaged in knowledge sharing with the former.

To best summarise the relationship between doctors and nurses, one can refer to Porter's ideal types of interactions between nurses and doctors to understand the various types of interactions which exist between doctors and nurses (Porter, 1991). In a study on doctors and nurses working in intensive care units and a general medical ward, Porter found that there were four possible interactions between doctors and nurses.

First, there is the unproblematic subordination of the nurse vis-à-vis the doctor. Here, the role of the nurse would be to assist the doctor and "nurse the room (provide a comfortable and hygienic environment)" (Porter, 1991, p.729).

Second, there is an informal covert decision-making between doctors and nurses. This relationship was best described by Stein's doctor-nurse game concept described earlier (Stein, 1967). It is a position where disagreement is avoided and where nurses possess knowledge but no definite power to make clinical decisions. Thus, it is still a subservient position for nurses to be in since they still need to pretend to be subordinates to doctors despite being knowledgeable and well able to make clinical decisions.

Third, there is the informal overt decision-making process between the two parties. As Hughes (1988) found, nurses can be powerful in some contexts yet unable to shift the balance of power elsewhere in the NHS organisation.

Fourth, there is the formal overt decision-making process where nurses are in a position to make informed clinical decisions regardless of their relationship with doctors. For instance, the creation of the advanced nurse practitioner role can be

viewed as an attempt to shift the balance of power between doctors and nurses as clinical decision making-process is overt and more formally acknowledged vis-à-vis the medical profession (Callaghan, 2008).

Overall, interpersonal and team-based antecedents in the NHS are strongly affected by the relationship between doctors and nurses (Sweet & Norman, 1995). In such context, knowledge transfer is dependent upon the interaction between these two professions.

3.3 Professional antecedents in the NHS: boundaries to knowledge sharing

The previous section described existing organisational antecedents that have or can have an impact on knowledge transfer in the context of the NHS. Much of the discussion also focused on the role of professions in shaping and influencing organisational antecedents. In effect, the impact of professions is not sufficiently acknowledged in the KM literature mainly because research studies tended to focus on private sector based organisations. Yet, there is empirical evidence suggesting that professions play a significant role in the knowledge management activity of an organisation, even for professional service firms (Empson, 2001). Therefore, it is even more relevant to add a professional dimension to the KM theoretical framework should one investigate the professionalised context of the NHS.

As mentioned above, professions can facilitate or inhibit the dissemination of knowledge in organisations (Ferlie et al., 2005). Therefore, their impact should not to be neglected when investigating knowledge transfer, particularly in a professionalised context such as NHS. As discussed in chapter 2, dissemination of knowledge in a profession can be facilitated when:

- knowledge is being used in context to diagnose, infer and treat patients
- there is an abstract body of knowledge supporting the above tasks
- there is a professional qualification acknowledging the relevance of such knowledge in a profession
- such knowledge favours the profession and allows members of the profession to differentiate themselves from incumbents (i.e. when the profession is treating interesting cases only because of the use of such knowledge)
- There are clear career incentives for using this specific set of skills

For instance, a specific set of knowledge will be more likely to be disseminated among its members when such knowledge is used on a regular basis to diagnose, infer and treat clients (Dingwall, 2001). When such knowledge is deemed partially relevant, such knowledge may be ignored by its professional members. In the context of the NHS, medical knowledge is used on a regular basis to diagnose, infer and treat patients. Therefore, medical knowledge is more likely to be disseminated across the profession and doctors are more likely to use it because it serves their interests (Ballard & Elston, 2005; Dingwall, 2008).

Second, a specific set of knowledge or skills will be more likely to be disseminated when it is well documented at an academic level. As chapter 2 discussed, the process of abstracting knowledge at an academic level constitutes a major step for a profession seeking an advantage over its competition (Freidson, 1970a). In the nursing profession, the creation of new roles such as healthcare assistant roles pushed the nursing profession to redefine, in academic terms, the role of the nurse vis-à-vis these new occupational roles. For example, Dingwall and Allen (2001) found that nurses often tried to differentiate themselves from the healthcare assistant by way of abstracting nursing knowledge or by reinforcing nursing values.

Knowledge will also be more likely to be disseminated within a profession when knowledge is accredited at both State and professional association levels. The role of a professional association is central to this process (Ferlie *et al.*, 2005; Newell *et al.*, 1995). In effect, professional associations indirectly encourage spread of knowledge by sponsoring or contesting a specific set of knowledge in the profession. A specific set of knowledge will be disseminated across the profession when such knowledge favours the profession and allows members to differentiate themselves from incumbents. As indicated in chapter 2, professions seek to achieve a higher position over other occupations trying to move into their jurisdiction. Therefore, one of the main tactics a profession may use is demarcation (Snelgrove & Hughes, 2000). For example, the nursing profession experienced emerging competition from new occupational groups. In particular, new roles such as operating department practitioners (ODPs) created intra-professional competition for the nursing profession, which also, competed with the medical profession for other healthcare activities (Witz, 1992). To differentiate themselves from incumbents, it was found that nurses

often used “atrocity stories” as a mechanism for demarcating themselves from other occupations such as ODPs (Dingwall, 1977; Timmons & Tanner, 2004).

Overall, education and professional associations contribute significantly to the dissemination of knowledge across members of a profession. Similarly, client differentiation can be a professional antecedent to knowledge transfer in a profession. Together, these antecedents have an impact on knowledge transfer in an organisation since professions can operate within organisations such as the NHS. Therefore, the professional hierarchy created by boundaries between professionals is more likely to be found in organisational contexts as well. This point is important to mention because it demonstrates that methods for transferring knowledge within a professionalised context may be altered by the presence and influence of professions in such context.

3.4 Knowledge management processes

Managing knowledge in the NHS is often achieved using three methods: information technology, structural changes and human resources management practices.

3.4.1 Information Technology and the NHS

The use of IT tools is not surprising in the NHS given the wealth of information individuals have to deal with. Technological advances in computing, opportunities to discover new patterns through elaborate algorithms stored in central databases and use

of evidence-based guidelines all contributed to make codification of knowledge possible in the context of the NHS. For instance, the NHS implemented electronic libraries and repositories of scientific information and research studies to facilitate knowledge transfer in the organisation (Kronefeld & Doyle, 2003). Similarly, policy-makers created key institutions to implement Evidence-Based Medicine within the context of the NHS (Gray et al., 1999; Plaice & Kitch, 2003; Turner, Gray, & Toth, 2002; Wales, 2005). For example, Gray and deLusignan (1999) found electronic libraries to be useful for solving the information overload problem.

However, technology itself is seldom an answer to facilitate knowledge transfer, especially in the context of the NHS. For example, studies reported that doctors, especially senior doctors, often struggled to use computers as part of their roles simply because they had limited computing expertise (Rosenberg & Donald, 1995).

In another study, Newell et al. found that information technology was used inappropriately because of the existence of multiple systems within the NHS (Newell et al., 2001; Newell et al., 2000).

3.4.2 Structural changes

The generic KM literature argued that structural changes such as the implementation of communities of practice or networks could facilitate knowledge transfer within organisations. Furthermore, commentators argued that such changes were seen to yield far better results than quick fix solutions such as the implementation of IT tools such as intranets or databases. This line of thought was also echoed in public sector research on knowledge transfer. In effect, public sector researchers began to question the relevance of codification strategies such as IT tools and preferred personalisation

strategies such as communities of practice and networks because they claimed it fitted the professionalised context of public sector organisations far better than codification strategies (Gabbay et al., 2003; Lathlean & Le May, 2002). For example, Gabbay et al. (2004) study on communities of practice is interesting because it reports knowledge–sharing behaviours in communities of practices of the NHS. For these authors, knowledge sharing depends heavily on these professional networks and communities of practice and policy-makers should encourage these communities across all sections of the NHS to leverage their knowledge bases. In another example, Lathlean and Le May (2002) found that communities of practices could be effective tools for sharing knowledge across professional boundaries in the NHS. Their views were that communities of practice, if well-designed, could become useful organisational mechanisms for disseminating knowledge across all parts of the NHS. In another study, Donaldson et al. (2005) found communities of practice to be useful for generating new knowledge. In their study of the UK Charity Macmillan Cancer Relief, the authors found that external groups to the organisation often acted as communities of practice. While these groups could not be managed directly by the charity, their presence strongly benefited the charity which was able to use ideas and conversations generated within these groups and turn them into tangible actions.

In relation to networks, studies on the evaluation of such structural antecedents tended to show that networks could provide substantial benefits to the organisation given the fact that there already exist professional networks in the NHS. For example, Conner (2001) discussed the case of a formal network in the UK Northern and Yorkshire Learning Alliance (NYLA), which was established to improve care. The author described the ways NYLA operated as a network, with a small team of change experts

working to develop change management and service improvement capacity across a large geographical area (Conner, 2001). In Conner's views, networks are beneficial to the organisation to the extent that it provides patients with additional services the NHS cannot normally provide because of financial constraints. Therefore, this study is consistent with other studies that argued that networks are useful when the organisation is not financially able to support the provision of specific services (Edwards, 2002). Thus, there is a view that networks can help knowledge transfer in the NHS.

However, other studies questioned the role of communities of practice and networks in knowledge transfer in the NHS. For example, Addicott et al. (2006) found that networks were not widely used in the NHS and that they did not produce policy-makers desired outcomes. In particular, the authors found that networks were focused on satisfying performance indicators rather than knowledge sharing objectives. In effect, the authors argued that professional networks were more likely to produce good results as opposed to mandated networks which policy-makers introduced as part of structural changes. In their views, professional networks which had existed long before recent modernisation policies were mostly comprised of individuals from a similar profession. Therefore, the authors concluded that knowledge was more likely to be shared in such context rather than in multidisciplinary networks recently introduced by modernisation reforms. Their study is also consistent with other studies highlighting the role of professions in knowledge transfer (Ferlie et al., 2005).

3.4.3 Human Resources Management practices

Few studies investigated the role of HRM practices in the context of Knowledge Management in the NHS. Instead, most studies on HRM practices in the NHS often studied HRM practices and retention rates in the NHS, especially in the nursing profession (Clarke, James, & Kelly, 1996; Emerson & Records, 2008; Joyce, 2005; Page & Meerabeau, 2000).

Nevertheless, there are studies which are worth mentioning that investigated the role of HRM in knowledge transfer in the NHS. For instance, work conducted by Currie et al from the Nottingham Business School is worth mentioning since it highlighted the inadequacy of HRM practices in relation to knowledge transfer. Essentially, it is found that HRM practices are not appropriate and unresponsive to the context of the NHS (Currie et al., 2008c; Gould, Drey, & Berridge, 2007). Overall, these studies show that HRM practices are not consistent and less likely to facilitate knowledge transfer as expected. For instance, training also appears to be underused, especially in relation to the nursing context (Rainbird & Munro, 2003). For example, Rainbird and Munro find that workplace learning in the NHS was often overshadowed by issues concerning job design, occupational progression and employees' entitlements (Rainbird *et al.*, 2003). Furthermore, studies found that developmental activities were often inhibited by the organisational problems such as:

- difficulty in obtaining study leave
- shortage of staff
- family and domestic responsibilities
- living in rural areas
- lack of financial support
- lack of advance notification, and

- programme not relevant to practice

For example, Munro (2008) found that nurses were confronted to a series of barriers that prevented them from accessing continuous development programs. Lack of resources from the organisation as well as motivation to undertake external courses represented important challenges for nurses (Watson & Thompson, 2000).

3.5 Research questions

The above raised questions as to whether current knowledge management theories can apply to the professionalised context of the NHS, in particular when investigating their relevance in a nursing context. In effect, since little is known on organisational and professional antecedents in professionalised contexts as the literature review argued, this study will examine such antecedents and knowledge transfer found in context. In particular, the research will investigate two research questions:

Research question #1: how do organisational antecedents affect knowledge in a professionalised context?

Research question #2: how do professional antecedents affect knowledge transfer in a professionalised context?

Answering these questions will help understand the importance of organisational and professional boundaries on knowledge transfer in the context of the NHS. It will also add to the literature in organisation studies by providing empirical evidence of a professionalised organisation.

Finally, this study will offer a different context to that of popular knowledge management studies as it investigates knowledge transfer in the NHS and the nursing profession. As a result, this study is completely different to most studies in the KM

literature and perhaps more enlightening for knowledge management researchers. In effect, the nursing profession, as argued before, is a fascinating context for knowledge management researchers because it is a profession tacit knowledge is strongly represented (Chua *et al.*, 1990). From its inception into the ecology of healthcare professions back in the 19th century to today's nursing, much of the knowledge transfer within this occupation occurred mostly on a tacit basis. Furthermore, such knowledge was often perceived to be respectful of nursing values of care as key actors of the profession argued, namely Florence Nightingale (Chua *et al.*, 1990).

Therefore, such context is suitable in a discussion on knowledge transfer. More to the point, the nursing context is an interesting area for knowledge management research because it presents some of the features most popular knowledge management studies often refer to when discussing knowledge transfer in ideal terms. For example, researchers in the KM literature are often fond of referring to on-the-job learning as an important medium for acquiring knowledge. In the nursing profession, on-the-job learning or experiential learning are commonplace and often regarded as the best way for nurses to acquire knowledge.

To recap, the study will investigate a context whereby some of the success factors for facilitating knowledge transfer are found. In doing so, the study will shed light on some of the current organisational and professional boundaries which can inhibit knowledge transfer.

3.6 Chapter Summary

This chapter was concerned with exploring the literature on knowledge management theory in the context of the NHS.

A first section discussed the complex nature of medical knowledge to provide a preliminary understanding of the professional forces which govern knowledge transfer in the NHS.

A second section discussed current organisational antecedents that are affecting knowledge transfer. In this section, the researcher showed that the organisational structure and culture was often affected by the influence of professions. Furthermore, the researcher provided empirical evidence on the existing role of HRM practices in knowledge as it is reported in existing studies.

A third section discussed professional boundaries which are affecting healthcare professions. In this section, the researcher showed that education, professional associations and client differentiation were important discriminating affecting knowledge in healthcare professions.

A fourth section discussed the ways knowledge was transferred in the NHS. Methods ranged from IT tools to HRM practices.

A concluding section presented the research gaps in the KM literature associated to the professionalised context of the NHS and introduced the research questions of the study.

Chapter 4 will now discuss the research methods used to answer those two research questions.

4 Chapter 4: Research methods

The previous chapter argued that more empirical research on professionalised contexts would benefit current knowledge management theories. More specifically, the researcher agreed with commentators that more studies should be conducted on the role of organisational and professional antecedents in knowledge transfer in the context of a professionalised organisation (Davies, 2003). This is why the researcher decided that researching the context of the NHS in relation to questions of knowledge transfer would be appropriate and relevant to the knowledge management literature. In particular, the researcher seeks to address research questions centred on the role of organisational and professional antecedents on knowledge transfer. More the point, the researcher seeks to answer the following research questions:

Research question #1: how do organisational antecedents affect knowledge in a professionalised context?

Research question #2: how do professional antecedents affect knowledge transfer in a professionalised context?

Chapter 4 describes the research philosophy and research methods used for investigating the research questions mentioned above. It addresses general epistemological and ontological assumptions which support the research questions and describes methods used to respond to the research questions. It is not concerned with ongoing epistemological and methodological debates on the importance or utility of certain philosophical paradigms. Rather, it provides readers with the methods used and the reasons behind using them.

The research project is underpinned by a subjectivist ontology and an interpretive epistemology (Morgan, 1986). It means that the researcher is of a view that, to understand reality, one needs to explore a context by studying interactions between individuals, groups, organisations and society. Such exploration is best achieved through qualitative research because the latter helps exploring and understanding new contexts through the eyes of a participant better than results from quantitative research methods (Ackroyd, 1996; Dingwall, 1998; Glaser and Strauss, 1967). For example, the objective of the study is to explore the role of organisational and professional antecedents on knowledge transfer in the professionalised context of the NHS. Therefore, the research project requires a qualitative research approach because the study is concerned with exploring a new context, that of the NHS in relation to knowledge transfer and specific knowledge transfer projects. This chapter has two aims:

- To discuss the epistemological and ontological considerations behind the study
- To discuss the research design of the study

These two objectives constitute the plan of the chapter. The first section is concerned with ontology and epistemology considerations about the nature of knowledge. The second section describes the research design of the study.

4.1 Ontology, Assumptions about human nature and epistemology

The research is underpinned by a subjectivist ontology and an interpretive epistemology. As Morgan (1980) states, 'knowledge and understanding of the world are not given to human beings by external events; humans attempt to objectify the world through means of essentially subjective processes' (Morgan, 1980; p.610). It is this subjective view of reality that underpins the research, where the social world is "constructed" by individuals, groups and institutions that create the reality in which they operate (Berger & Luckmann, 1963; Berger & Luckmann, 1966; Burrell & Morgan, 1979; Denzin, 1970). This subjective reality is based on the historical, cultural, political and economic context in which the actors exist and is set "against a backdrop of shared understandings, practices, language and so forth" (Schwandt 2000, p.193). Within this subjective reality, the interpretive paradigm suggests it is possible to identify underlying patterns and order within the social world (Burrell *et al.*, 1979), to better understand ways which this reality is constructed.

The interpretive paradigm is focused on the creation of meanings within certain contexts and how those meanings and experiences are understood to constitute social action (Burrell *et al.*, 1979; Schwandt, 2000). The researcher acts as an interpreter, who attempts to identify meanings associated with particular social action and/or processes through such things as conversation and interaction between participants. Thus , the researcher seeks to understand the subjective meaning of action through participants words or actions (Schwandt, 2000). At the same time, the researcher challenges our own preconceived notions about the process in question by questioning what is happening in a context (Murphy, Dingwall R., Greatbatch D., Parker S., & P., 1998; Toren, 1996). As a result, the researcher helps us understand meanings behind actions and patterns found in a context. It is a reflexive process which depends enormously upon the researcher's interpretation of a context. It is not about being

objective as defined in positivist terms. Rather, objectivity in this sense refers to the researcher's ability and willingness to listen to and "give voice" to participants (Strauss and Corbin 1998, p.43).

In essence, the researcher acts as an interpreter of the participants' constructions or interpretations of the social world, looking for patterns that help describe and explain social activities. Thus, both the researcher and the participant are each at the centre of their own hermeneutic circle (Denzin, 2002). The researcher moves from a stage of pre-understanding to a stage of full understanding of a context whereas the participant re-interprets his or her context in ways which he or she would not have thought of. Within this context, the act of understanding is iterative as data are interpreted and re-interpreted (Eisenhardt, 1989, 1991). Within this process of interpreting, the researcher responds as a whole person and acts as an instrument in observation, selection, coordination, and interpretation of data (Eisenhardt, 1989, 1991).

An interpretive paradigm also assumes continuous conflict between the individual and his/her social world. This social world is regarded as an intricate web of multiple relationships created by individuals in constant interaction with one another and larger structures which, themselves, are viewed as long-standing, almost permanent and autonomous crystallisations of human interactions. Such larger structures can be the State, a clan, a family, a guild, a city, a profession, an organisation or an institution. These structures participate to regulate patterns of interactions but also confront the individual as if they were alien powers and enemies (Burrell *et al.*, 1979). As a result, an interpretive paradigm not only assumes that individuals have control over their environment through their symbolic interpretations and interactions with their

environment. It also assumes that individuals are influenced by such environment and assumes that there are contradictory forces which are forcing individuals to behave in a particular way (Burrell *et al.*, 1979).

Thus, an interpretive paradigm is an appropriate epistemology for investigating professionalised contexts such as the National Health Service because they are or have become large institutions where underlying patterns of social action are produced and applied by individuals. In other words, the interpretivist approach is useful to this research because it tries to "understand the fundamental nature of the social world at the level of subjective experience" (Burrell and Morgan 1979, p. 28). It focuses on identifying and investigating patterns in context-specific social processes and their associated meanings, based on the interaction of individuals and groups with their social environments. Such processes are revealed by the researcher who also participates in some ways to the interactions with the individuals he or she gets to interview or observe.

Thus, in the context of the study, the processes being investigated are those related to knowledge transfer. These processes are based upon specific patterns which are thought to guarantee knowledge transfer in a local context. For example, on-the-job learning is a process which is viewed as enhancing practice. Similarly, formal education is a process which requires individuals to attend university. All of the above, in an interpretive paradigm, can be viewed as processes with underlying patterns of social actions to the extent that they have been created by individuals. Furthermore, these processes force individuals to act in such a way so that they could achieve their needs as part of a specific group.

To recap, the interpretive paradigm views knowledge transfer processes as patterns with specific meanings which are dependent upon individuals' interactions with each other and other larger superstructures such as the NHS as an organisation and professional institutions. Furthermore, an interpretive is sympathetic to the view that knowledge transfer processes can be difficult to implement because of the presence of existing relationships between individuals and organisations (hierarchies, departments and so on) as well as the influence of professions on organisations.

The researcher seeks to explore a professionalised context to understand the role of organisational and professional antecedents in knowledge transfer programmes. Specifically, the objective of the study is to analyse knowledge transfer in a relatively unexplored context for knowledge management researchers, that of the NHS and the nursing profession. The focus is on exploring views of individuals on how their organisation and their professional contexts contributed to facilitate or inhibit knowledge transfer. Thus, the contribution of the study is to add empirical support to an emerging KM literature which already questions and critiques the generic KM literature on generalisability grounds (Currie, 1999, 2006; Currie et al., 2008a; Currie et al., 2008b; Currie & Kerrin, 2003; Currie et al., 2004; Currie & Procter, 2002; Currie et al., 2006a; Currie et al., 2008c). It is also a contribution to the knowledge management literature because it is concerned with the nursing profession, which in knowledge management research, is virtually non-existent so far, at least when investigating key publications in the KM literature.

The researcher decided that a qualitative research approach would be the most suitable research strategy to gather individuals' interpretation of the role of organisational and professional antecedents on knowledge transfer in the professionalised context of the NHS. Although it is difficult to define qualitative research, one can view qualitative research as being a body of methods that aim to explore and create new theory. As Van Maanen put it:

> "The label qualitative method has no precise meaning in any of the social sciences. It is at best an umbrella term covering an array of interpretive techniques which is seen to describe, decode, translate and otherwise come to terms with the meaning, not the frequency, of certain more or less naturally occurring phenomena in the social world" (Van Maanen, 1979, p.520).

Qualitative research strategies decode and translate interpretations of individuals. These are often representative of phenomenological, interpretive and social constructionist paradigms. Qualitative research is also a useful approach for understanding individual interpretation of a specific context (Cassell & Symon, 2004). Thus, qualitative research is different than quantitative research as Bryman commented:

> "Qualitative research derives from a different cluster of intellectual commitments from quantitative research. Consequently, crucial epistemological differences between the two approaches mean that they operate with divergent principles regarding what is knowledge about the social world and how it can legitimately be produced" (Bryman, 1988, p.50).

Qualitative research strategies are more appropriate for describing complex phenomena because their analyses are more meaningful for understanding a context than quantitative research strategies. Similarly, qualitative research methods are more appropriate than quantitative analyses to investigate events or phenomena occurring

over a period of time or across different contexts. As such, qualitative research strategies provide longitidunal and comparative dimensions to empirical studies that quantitative research methods may not provide. It also means that researchers are able to capture processes as they occur over a period of time (longitidunal dimension) and across a number of settings (comparative dimension). For example, the comparative dimension of qualitative methods is valuable to the current study because the researcher can interpret how organisational and professional boundaries affected knowledge transfer occurred across various case studies. Similarly, the longitidunal dimension of a qualitative research method is valuable to the study because it helps understand how changes developed over time. Thus, qualitative research strategies are useful for exploring new contexts such as the NHS, at least in a knowledge management debate, and their antecedents to complement existing theories as applied in these contexts.

4.2 Research design

Seven key areas of the research design of the study are discussed here. First, the context of the study is described. Second, the comparative case method is defined. Third, the theoretical sampling method is explained. Fourth, a section discusses data collection and the use of semi-structured interviews to address the longitidunal and comparatives dimensions of the study. Fifth, a section provides an overview on the ways these research instruments were applied in the study. Sixth, a section discusses research ethics. Seventh, data analysis is explained.

4.2.1 Context of the study

The context of the study is that of the UK National Health Service (NHS). More specifically, the study investigates knowledge management pilot projects (referred to as Mainstreaming Genetics projects or simply MG projects) inspired by a White Paper published in 2003 entitled "Our inheritance, our future - realising the power of genetics in the NHS" (Department of Health, 2003b). The overall goal of the Paper was to reinforce the use of genetic services across all branches of the NHS, especially primary care. Essentially, the Paper planned to create new roles for nurses to take on, invest in training and information technology to facilitate the transfer of genetic knowledge across primary care organisations in the NHS. To achieve these goals, the Department of Health invited bids for up to £2 million to bring genetics into mainstream clinical areas. The Department was supportive of projects where skills of specialist nurses, genetic counsellors or other health staff would be used as part of network-based or cross-functional teams. It also welcomed initiatives where nurses would become the main providers for genetics services, at least for a certain category of patients. The Paper also recommended the use of evidence-based medicine in the form of the Kenilworth model, which represents here a codified version of genetic services individuals can use anywhere in the organisation to provide genetic services. The programme consisted of four streams and 32 pilot sites. One stream, comprised five sites, involved piloting a method of identifying relatives of those diagnosed with a common inherited disorder, familial hypercholesterolaemia. A second stream of ten sites involved service development projects which incorporated genetics into provision in other clinical fields in secondary and primary care. Third, seven pilots, co-funded with Macmillan Cancer Support, implemented a new care pathway for people at possible risk

of inherited cancer, across primary, secondary and tertiary care. Finally, 10 general practitioners (GP) with a special interest (GPSI) in genetics were funded to acquire education of genetics and champion the cause of genetics within their existing local context in primary care. While most pilots were led by hospital-based staff in secondary or tertiary care, some—notably the GPSI initiatives, but also a few in other streams—were hosted by Primary Care Trusts (PCTs) and led by primary care practitioners such as clinical nurse specialists. Such projects represented an excellent opportunity to study knowledge transfer as the overall goal was to, precisely, transfer knowledge between members of the organisation. These projects are described below. For confidentiality reasons, naming conventions were used to protect the privacy of individuals and comply with university and NHS research ethics standards.

To recap, four projects funded by the Department of Health were selected for the purpose of the study as they involve participation of nurses. Six more projects funded by the Macmillan charity organisation were also selected for the study.

	Mission	Who is involved	Duration	Speciality
Funded by the Department of Health				
GENTrust 1	Integrate renal genetic and nephrology services into a single patient model (alter patterns of referral to specialist services) Develop patient pathways to identify patients at risk of cardiac, endocrine or renal genetic conditions in primary care and introduce specialist nurse-led and MDT clinics to manage and follow-up in secondary care	Nurse Specialist/Clinical Specialists/ Renal dietician – 'on call'/ Administration Support/ Research scientists – genetic tests/ IT support/ Genetic Counsellor (to be recruited) Nurse Specialist – Renal Genetic Disorders/ Nurse Specialist – Cardiac Genetic Disorders/ Nurse Specialist – Endocrine Genetic Disorders/ Nurse Specialist – Endocrine Genetic Disorders/ Highly Specialist Nurse in Genetic Education/Highly Specialist Genetic/ Counsellor/ Multidisciplinary Clinic Administrator/ Project Manager/ Outreach and Research Co-ordinator –	2 years 2 years	Renal Cardiology, Endocrinology and renal
GENTrust 2	Establish community based, hospital linked, genetic services for families in local area where there is a high incidence of autosomal recessive disorders.	Research Fellow or Academic/ Related 2 Asian speaking Primary Care Genetic Co-worker/ • Database maintenance (A&C 3)/ • Genetic Counsellor/ • Administrative Support (A&C 3)/ •	2 years	Autosomal disorders (Examples of autosomal recessive disorders include cystic fibrosis, sickle cell anemia, and Tay Sachs disease)
GENPct 1	To develop a liaison service – for a liaison genetic counsellor to work with medical specialities.	Consultant Paediatrician	2 years	
GENDir	Proposal for genetics nurse practitioners/counsellors to work in the community	Liaison Genetic Counsellor / Consultant Support/ Administrative Support	2 years	Neurology, Cardiology, MODY diabetes, Nephrology (all adult)
GENTrust 3	Establish a targeted education programme covering a wide range of genetic diseases, open to health care professionals in primary, secondary and tertiary care – from Genetics and a wide range of other specialities.	Genetic Counsellor/ • Project Manager & Clinical Consultant/ • Project Lead	2 years	N/A
GENTrust 4		Education Programme Administrator	2 years	N/A
GENTrust 5	To raise awareness of genetics and the genetic service in the local community	Project Worker/ Secretarial/Administration support	2 years	N/A
GENTrust6	Develop integrated care pathways and guidelines for routine monitoring of selected genetic disorders in primary and secondary care	Genetic Service Development Co-ordinator/Senior Cardiac Nurse - Grade G/Administration support	2 years	neurofibromatosis type 1, achondroplasia, tuberose, sclerosis, Huntington's, Marfan, Turner and Williams Syndromes.
GENTrust 7	Development of integrated care pathway for familial haemochromatosis	Clinical Nurse Specialist (secondment for 1 year)	18 months	haemochromotosis
GENTrust 8	Development of specialist ophthalmic-genetic counsellor and care pathways	Ophthalmic Genetic Counsellor	2 years	Ophthalmology

Figure 2: MG projects

Funded by MacMillan Cancer Research	Mission	Delivered by	Duration	Cancer Speciality
MGENTrust 1	To develop a model for risk assessment and counselling in breast, colorectal, gynea and rare tumour cancers	Genetic Risk Assessment Practitioners (GRAPs, nurse role)	2 years and 6 months	Breast, colorectal, ovarian. Other cancers risk assessed but referred to tertiary genetics for management
MGENPCT 1	Provide a "whole systems" approach – promote awareness of cancer family history amongst the local population and health care professionals. Targeting black and ethnic minority groups.	Macmillan Community Clinical Nurse specialists (CCNS) and family history trainer	2 years and 3 months	Breast, colorectal, and ovarian. Other cancers recognised and passed to genetics clinicians if appropriate.
MGENPCT 2	To test effective models of care that are consistent with the PCT plans to develop a Locally Enhanced Service in the area – "Enhanced Primary Care Service".	Clinical Nurse Specialist (CNS) and GP with a special interest (GPwSI)	2 years	Breast, Colorectal and Ovarian. Other cancers if required.
MGENPCT 3	Development of primary care led service, accessible through GPs to provide consistent and correct information, advice assessment, support and referral by appropriate trained person and counselling	Community Cancer nurse specialist	12 months	Primarily breast, ovarian and colorectal but patients with concerns about any type of cancer seen
MGENCN 1	To develop a new primary care led cancer genetics service. Primary care led model for a rural population, which aims to reduce inequalities in breast, ovarian and colorectal cancer service provision	Cancer genetics project co-ordinator and Primary care genetics nurse specialist	2 years	Breast, Ovarian, Colorectal. Other cancers discussed with geneticist and referred if required
MGENTrust 2	Providing information and genetic counselling to individuals with family history of cancer mainly in the local areas .	Macmillan project coordinator (nurse)	2 years and 2 months	Breast, colorectal, and ovarian. Other cancers handled in consultation with regional genetics

Figure 3: MG projects continued

Macmillan projects were all relevant to the study because they required active participation of nurses. These projects had three objectives. The first objective was to raise awareness in the local health community with a series of workshops on genetics. The second objective was to train GPs and other healthcare staff about genetics services. The third objective was to screen patients early enough and refer patients and/or their family to appropriate services according to their risk levels. Thus, should a patient be at a low risk, nurses would be able to provide guidance as well as possible treatments options for the individual. Similarly, should a patient be at a high-risk of developing a particular condition, this individual would be referred to genetic consultant specialist for diagnosis and treatment.

These projects represented excellent knowledge transfer opportunities. In effect, all of these projects aimed at disseminating genetics knowledge across generalist contexts of the NHS. At the same time, each project was implemented in a different context across the country. Therefore, every project was a unique opportunity to understand the role of organisational and professional antecedents in knowledge transfer. In addition, each of these projects was unique because of the different context in which such project was established. As a result, each project represented a different context which added more value to the researcher who was able to add a comparative dimension to the study of organisational and professional antecedents of knowledge transfer. Similarly, the duration of the projects (on average two years) gave the researcher an opportunity to explore the issue of knowledge transfer on a longitidunal basis. That is, the researcher was given the opportunity to analyse changes occurring over time. For example, other members of the research team which the researcher was

part of interviewed participants on numerous occasions to explore issues as they developed over time (Martin *et al.*, 2007).

The researcher also gathered views of educators and professional association members to explore professional antecedents to the dissemination of genetics within the nursing profession. As such, the researcher was able to fully explore the professional dimension to knowledge transfer which this study intended to investigate.

4.2.2 The comparative case study method

One of the main features of the study is the comparative dimension of the case approach used to investigate antecedents to knowledge transfer. In effect, the researcher used a case study approach to investigate the pilot projects where knowledge transfer initiatives were found. Yin (1994) defines the case study inquiry as:

> "An empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident...the case study inquiry copes with the technically distinctive situation in which there will be many more variables of interest than data points, and as one result relies on multiple sources of evidence, with data needing to converge in a triangulation fashion, and as another result benefits from prior development of theoretical propositions to guide data collection and analysis." (Yin, 1984, p.13)

A case study often requires more than one research technique. It can be viewed as a systematic piecing together of detailed evidence to generate or perhaps replicate theories (Hartley, 2004). It is not a method whereby "anything goes" as Silverman (2001, p.157) warned. Rather, the case study method is systematic (Silverman, 2001) and helps tackle issues of interpretation of data more consistently. In the long run, a

case study strategy can help researchers build tentative propositions because this approach is appropriate for exploring new processes or a new set of interactions so far unexplored in existing literature (Eisenhardt, 1989; Glaser & Strauss, 1967).

For the purpose of the study, the researcher used a comparative case study approach. This comparative approach was based on Eisendhart's methodology which is described below (Eisenhardt, 1989).

The first step consists in defining the research question and selecting appropriate research methods. In the research project, research questions were informed by the literature review, which suggested that more empirical research was required to understand knowledge transfer in a professionalised context such as the NHS. A second step consists in defining and selecting the appropriate cases for investigating the research questions at hand. In the study, pilot projects were defined as cases because they represented relevant knowledge transfer examples. A third step is concerned with "crafting instruments and protocols" for collecting data (Eisenhardt, 1989 p.537). These instruments can include interviews, observation or document analyses. In the study, the researcher used primary data as he interviewed participants in the pilot projects and key actors of the nursing profession. Semi-structured interviews were used alongside documents providing more information on the context of the pilot projects such as pilot project bids documents for example. This step is explained later in the data collection paragraphs of this section. A fourth step is concerned with "entering the field" for collecting and analysing data. This is also explained later in this section. A fifth step is concerned with performing a "cross-case pattern search using divergent techniques" (Eisenhardt, 1989, p.541). Cross-case comparisons "force investigators to look beyond initial impressions and see evidence

through multiple lenses" (Eisenhardt, 1989, p.541). A sixth step involves "shaping" propositions by building on initial impressions when analysing data. A seventh step is concerned with "enfolding" the literature where the researcher compares findings with the existing theoretical framework. The last step is concerned with "reaching closure" whereby no new knowledge can be gained from analysing data. Thus, as Eisenhardt acknowledged, the "process of building theory from case study research is a strikingly iterative one" (Eisenhardt, 1989, p.546).

The comparative case approach as depicted by Eisendhardt is a systematic and consistent research approach despite its known flaws and critiques (Dyer & Wilkins, 1991). In effect, Eisenhardt's methodology is not immune to critiques. In particular, some commentators fiercely opposed to the idea that multiple case studies were more valuable than single case studies in terms of interpreting a context or a phenomenon. As Dyer and Wilkins argued, a single case study can often bring as much detail as comparative case study methods. In other words, Dyer and Wilkins do not consider the comparative case study method to be any superior or more informative to single case study methods. In their eyes, a single case study has as much qualities as comparative case studies because of the great detail researcher can often report in their study. As a response to this argument, it is argued here that the purpose of the study was not to investigate knowledge transfer within a single context but rather across multiple contexts in an effort to explore different contexts and find differences and similarities across such contexts that could illuminate and contribute more to the KM literature.

4.2.3 The theoretical sampling method

Theoretical sampling is a term coined by Glaser and Strauss (1967) to describe the process of selecting cases in a study. It represents the second step in Eisenhardt's case study methodology. Theoretical sampling is defined as:

> "Data gathering driven by concepts derived from evolving theory and based on the concept of "making comparisons", whose purpose is to go to places, people, or events that will maximise opportunities to discover variations among concepts and to densify categories in terms of their properties and dimensions" (Anselm et al., 1998, p.201)

In the context of the study, the concern for investigating organisational and professional boundaries of knowledge transfer required two theoretical sampling strategies.

In relation to organisational antecedents, the comparative case study method required cases that satisfied two important criteria. First, the researcher required individuals who engaged in knowledge transfer in a professionalised context. This requirement represented the single most important criterion. Second, the researcher required cases where organisational antecedents of knowledge transfer could be observed. For instance, projects needed to be structured around a network-based organisational structure as recommended by the generic KM literature. Similarly, the researcher was interested in cases where a cross-functional team structure could be observed. Or cases where nurses occupied a different organisational grade were also relevant to the study. In other words, the researcher was interested in cases where different boundaries such as the boundary between primary/secondary care could be observed. The researcher was also interested in cases where data on HRM practices could be

collected. Thus, cases involved autonomous teams were of interest to the researcher since these were most likely to be of a different nature with cases where nurses worked in hospitals in terms of HRM practices.

In relation to professional antecedents, the sample of respondents needed to fulfil two conditions as well. First, cases needed to have a professional dimension. This was achieved by interviewing professional members of the projects (i.e. nurses and genetic counsellors). Second, the researcher needed to include feedback from key members of the nursing profession such as educators and professional association members. In doing so, the researcher was able to explore the role of nursing professional institutions in knowledge transfer of genetic.

Based upon these criteria, the researcher built a theoretical sample composed of four types of respondents: nurses from the MG projects, genetic counsellors, educators and one member of a leading nursing professional association.

Nurses involved in the MG projects were central to the study because their views represented the most relevant source of data to investigate the role of organisational and professional antecedents on knowledge transfer. Recruitment of participants was facilitated by the researcher's involvement in a wider research project that evaluated NHS genetics services investments on a national scale. This project was led by Professor Graeme Currie from the University of Nottingham.

Genetic counsellors' views were gathered in an effort to understand the impact of professional boundaries on knowledge transfer. Genetic counsellors were also recruited through the wider research project on national evaluation of NHS genetics services led by the Nottingham research team.

Educators were university lecturers responsible for developing and teaching genetics at university level. Their views were important for understanding the dissemination of genetic knowledge and its relevance for the nursing occupation. Educators were recruited using a snowball sampling technique. The snowball sampling technique is a technique used to recruit participants based on recommendations from earlier respondents (Ackroyd, 1996a). In this research, the researcher was able to recruit educators using personal acquaintances of two respondents who kindly agreed to circulate the research project information across their personal network of educators and colleagues.

Professional associations also play a role in the diffusion of knowledge in a profession. In this study, a learning project officer from a leading nursing professional association agreed to participate in the study. The project officer was recruited using the nursing professional association website. It is important to note that the researcher contacted several members from two of the leading nursing professional associations in Britain. At the time of the study, only one project officer agreed to be interviewed in the context of the study.

The table below provides the list of participants from the seven case studies who agreed to participate in the study. Names were changed to avoid conflict of interest and to respect individuals' privacy as per NHS research ethical requirements and the University of Nottingham data protection policy (National Research Ethics Service, 2009; The University of Nottingham, 2009).

Nurses			
MGENPCT 3		**Educators**	
Pam	Nurse	Dalida	Worked as a genetic counsellor. Part-time lecturer
Julia	Nurse	Katia	Worked as a genetic counsellor. Trainer's trainer on genetics.
Patricia, Genetic counsellor	Genetic Counsellor	Luka	Full-time lecturer. Responsible for a health sciences program in a nursing and health sciences department
Laetitia	Nurse	Patrice	Senior lecturer in biological sciences
MGENTrust 1		Helena	Head of research in a nursing department
Sarah	Nurse	Lydia	Project manager in a nursing department
Milla	Nurse	Denis	lecturer in biological sciences
MGENTrust 2		Samuel	lecturer in anatomy and physiology
Carla	Genetic Counsellor	Laurence	senior research fellow
Cindy	Nurse	Ellen	senior genetic counsellor working as a trainer's trainer for healthcare staff
Terry	Nurse	**Professional association**	
Jay	Genetic Counsellor	Dilla	Project officer responsible for learning and continuous development in a nursing professional association
GENTrust 2			
Roisin	Project Manager		
Nicola	Nurse		
Petra	Nurse		

Ulrika	Nurse		
Alice	Educator/Nurse		
MGENPCT 2			
Valerie	Nurse		
GENTrust 7			
Tabatha	Nurse		
GENTrust 1	Nurse		
Tony	Nurse		

Figure 4: Table of participants

4.2.4 Data collection: Semi-structured interviews

Semi-structured interviews were used to collect data from respondents who kindly agreed to participate in the current research project. Qualitative interviews aim at exploring views and opinions of respondents to understand a phenomenon or meanings in a particular context. Kvale (1983) defines the qualitative interview as:

> "An interview, whose purpose is to gather descriptions of the life-world of the interviewee with respect to interpretation of the meaning of the described phenomena" (Kvale, 1983, p.174).

The purpose of the interview in a qualitative tradition is not to collect quantifiable responses (Kvale, 1983). Rather, interviewing in a qualitative tradition is concerned with interpretation of a context both from the interviewee's perspective and that of the researcher (Denzin, 1970; Mishler, 1979). Denzin (1970) distinguished between three types of interviews: standard schedule interview, non-standardised interview and the semi-structured. A standard schedule interview follows a rigid structure where

wording and order of questions are the same for every informant. A non-standardised interview has no order or specific themes. A semi-structured interview follows a list of questions which, overtime, may be changed to adapt to data collected and emerging themes (Denzin, 1970; Patton, 2002).

In the current study, the researcher used a semi-structured interview technique for the following reasons.

Standardised interviews were not suitable to the research questions because they could not capture views of respondents in detail (Mishler, 1979). In effect, standardised interview techniques often fail to consider the breadth of interactions that exist in a social encounter between the interviewer and the interviewee. For instance, standardised interviews would often ignore situational factors affecting the encounter between the researcher and the informant. These may include "their attractiveness or unattractiveness to one another, their bodily presence, the social, physical and role distance" (Cicourel, 1964, p.80). Just as in everyday life, these factors play an important part in the way both parties act in the interview.

A non-standardised interview technique was also inadequate in the context of the study because of the risk associated with collecting large amount of irrelevant data. In effect, a non-standardised interview could provide a great deal of information to the researcher. However, such data can also be a double-edge sword to the researcher. For instance, the researcher can be overwhelmed by such amount of information (Ackroyd, 1996b). In addition, data collected could be irrelevant to the context of the study because of a social desirability bias whereby a respondent would be presenting oneself in a positive light or instead underreport bad behaviour in an effort to look

good to the eyes of the researcher (Murphy et al., 1998). Consequently, it would be incorrect to assume that non-standardised interviews grant access to an insider's view. Rather, a non-standardised interview technique may only give access to public accounts as Murphy et al. commented:

> "Just as we are suspicious of the media's claim to access personal experience through interviews with celebrities, we should be wary of the claim that research interviews have uncovered authentic human experience. In both cases we may have done nothing more than elicit familiar and socially acceptable ways of accounting for success or failure." (Murphy et al., 1998, p.117)

A non-standardised interview was also irrelevant to the study because the researcher was interested in analysing a context in relation to existing KM literature. Thus, the researcher needed to impose some structure around the interview process to ensure key themes were discussed at data collection stage.

Therefore, the researcher felt semi-structured interviews to be more appropriate to the study because it is an interview technique adequate enough to help investigate the context of the NHS in relation to existing theories of knowledge transfer. The researcher was able to collect data around key themes of the knowledge management literature using an interview schedule. In addition, the researcher could collect more data than the standardised interview technique. For instance, semi-structured interviews offered more flexibility during data collection because the researcher was able to add questions to the initial interview schedule initially prepared to collect data. Similarly, the researcher was able to follow a framework of themes and issues related to knowledge transfer so that a certain structure and organisation of themes could be consistently asked at interview meetings with participants.

The researcher was also aware of some of the pitfalls commonly associated with semi-structured interviews. Indeed, semi-structured interviews are, just like any other social interaction between two individuals, subject to social norms and rules. This can create what Murphy et al. termed "a dance of expectations":

> "I produce my actions in the expectation that you will understand them in a particular way. Your understanding reflects your expectations of what would be a proper action for me in these particular circumstances which, in turn, becomes the basis of your response which, itself, reflects your expectations of how I will respond. And so on. At any point, there may be disjuncture between actions, responses and expectations which requires that the parties engage in some sort of repair work." (Murphy et al., 1998, p.120)

Also, the researcher was aware that some research topics might be too sensitive to be discussed that interviewees would perhaps only give public or official accounts. Finally, the researcher was also aware that semi-structured interviewing could be as time consuming as non-standardised interviews. Therefore, the researcher was also aware that interviewees could be rushed into their responses. All of these issues were acknowledged in the current research project. For instance, the researcher guaranteed to interviewees that data would be treated as confidential, especially when reporting findings of the study in his doctoral thesis. In addition, the researcher tried to make sure interviews would not affect their working time. That is, the researcher was clear that interviews would last around 90 minutes to ensure that individuals would be able to come to the interview without having to worry about their jobs.

Overall, the research design of the study called for an appropriate data collection technique capable of exploring organisational and professional antecedents to knowledge transfer. The choice of the semi-structured interview was considered appropriate because, as explained, it was a technique that allowed the researcher to

explore views of participants on issues of knowledge transfer and antecedents in the context of the NHS whilst ensuring consistency in collecting data.

4.2.5 Research instruments

The researcher conducted 29 interviews over a nine months period (from January 2007 to October 2007). These interviews also contributed to the larger evaluation project at the University of Nottingham on NHS Genetics Service Investments from a longitidunal and comparative perspective. The objectives of the national evaluation were to explore organisational issues faced by members of the pilot projects. For example, the evaluation explored issues related to transformational leadership, an important theme in the government modernisation agenda of the NHS. 11 out of the 32 pilot projects were selected to conduct this national evaluation. Pilot projects were selected on the basis of characteristics such as the host organisation (primary care/ secondary care/ tertiary), lead profession (medic/nurse/ genetic counsellor), profile of patients served (ethnic mix, rural vs. city) or the nature of service provision (what is done, by whom, where). Key interviews were conducted with specialist geneticists, genetic counsellors, nurses, general practitioners, consultants and managers. In total, 85 interviews were conducted by the research team which the researcher was part of.

All 29 interviews were tape-recorded using a semi-structured interview structure as mentioned above. These interviews varied in length, from 40 minutes to two hours. It should be noted that interviewees were interviewed twice by the research team thus covering the longitidunal aspect of the research. For instance, researchers within the

research team interviewed nurses on issues related to leadership while the researcher of the current study interviewed nurses on issues related to knowledge transfer.

A set of research documents was used to recruit participants. These included covering letters and consent forms sent electronically and postal mail (see appendix 2). These were documents inspired by recruitment documents used by the Nottingham research team. There were two reasons for replicating these documents in the current research project. First, the researcher wanted to ensure that these documents were appropriate and consistent with University of Nottingham research codes of conduct and standards of qualitative research methods in relation to access to respondents (Schwandt, 2000; The University of Nottingham, 2009). Second, the researcher expected respondents to be more likely to give their consent to the study given their previous participation in the national evaluation. As such, the respondent mentioned explicitly in the recruitment letter that participants were recruited because of their previous involvement in the NHS evaluation projects.

Four interview schedules were created to suit each category of respondents.

An interview schedule was specifically designed for interviewing nurses in the MG projects (see appendix 4). The schedule was divided into three sections of questions to ask respondents. The first section collected data on nurses' background and expectations about their role in the MG projects. For example, the researcher asked questions such as "could you tell me more about your previous roles before moving into the MG project?" Questions were based on an open-ended type to avoid leading questions and to encourage discussion between the researcher and the interviewee.

The second section collected data from nurses on methods of learning and barriers to learning in the MG projects. For example, the researcher asked questions such as "how did you learn about genetics?" and "who did you learn the most from?" The researcher also collected data on the relevance of evidence-based guidelines in the MG projects as well as the use of information technology tools in facilitating learning about genetics. The researcher also collected data on potential professional boundaries found in the MG projects. As such, the researcher asked questions on whether nurses used resources from key nursing professional associations.

The third section collected data on career development and job opportunities after the MG projects. Questions such as "was this project useful for getting another job?" were important to address ways nurses perceived their learning efforts in relation to career prospects.

Where relevant, the researcher modified the schedule to investigate emerging themes as suggested by Eisendhart's methodology. As a result, some questions were disregarded and new ones were asked when relevant.

A different schedule was designed to collect data from genetic counsellors (see appendix 5). The schedule was also divided into three sections. The first section gathered information on their background. The second section collected data on potential organisational and professional challenges to knowledge transfer in the MG projects. The third section collected data on possible careers pathways after the MG projects.

A different schedule was also used to collect data from educators in the nursing profession. The schedule was also structured around three sections (see appendix 6).

The first section collected data on educators' background. The second section collected data on the provision of genetics knowledge in nursing education. The third section gathered feedback on potential career pitfalls associated with genetics.

A similar schedule was drafted to collect data from the member of the professional association (see appendix 7). A first section collected data on the project officer's background. A second section collected data on the role of nursing professional associations in supporting genetics in the nursing profession. A third section collecting data on career opportunities in the genetics industry, especially for those involved in the MG projects.

4.2.6 Research ethics

Research ethics are important in scientific inquiry and help support findings of a study. As Rosenthal commented:

> "A central theme is that ethics and scientific quality are very closely interrelated. Everything else being equal, research that is of higher scientific quality is likely to be more ethically defensible. The lower the quality of the research, the less justified we are ethically to waste research participants' time, funding agencies' money, and journals' space." (Rosenthal, 1994, p. 127)

To address ethical issues associated with the current study, the researcher followed Rosenthal 's recommendations on ethics of research (Rosenthal, 1994). Rosenthal argued that ethical research should satisfy three aspects: conduct of the research, data analysis and reporting of results.

In relation to the conduct of the research, Rosenthal suggested researchers pay attention to issues of consent, confidentiality, inaccurate conclusions, social desirability bias, hyperclaiming, caucism and issues of costs and utility of research. Rosenthal argued that informed consent and accurate conclusions were good signs of an ethical research. For example, Rosenthal suggested that research design can be unethical if informed consent was not obtained appropriately. Similarly, poor quality in research design can lead to inaccurate conclusions which can be detrimental for theory and practice. In the context of the study, the researcher was able to obtain formal consent prior data collection using existing consent forms drafted by the research team at the University of Nottingham. In addition, the researcher had to comply with requirements from NHS research ethics committees which grant access to NHS employees and patients after careful review of research proposals. If successful, researchers are also asked to undergo a Criminal Record Check (CRB) and obtain a formal honorary contract from the NHS. Both of these were obtained by the researcher. In addition, names were changed to protect individuals' confidentiality. Data was stored in a locked filling cabinet, according to the University of Nottingham research code of conduct (The University of Nottingham, 2009). These rules state that data must be kept for 7 years following its last publication and then reviewed for destruction. In addition to this, audio files which interviews were digitally stored on were kept on a password protected computer and all paper copies locked away each day after use. As mentioned earlier, a social desirability bias can affect the quality of findings. To solve this problem, the researcher exposed the goals of the study as clear as possible prior the interview and explained that data would be kept confidential. Finally, research design was inspired by Eisendhardt's methodology which was exposed earlier in this chapter.

The researcher also tried to tackle the problem of hyperclaiming. Hyperclaiming can be described as telling others (respondents, funding bodies, etc.) that proposed research is likely to achieve goals that are in reality unattainable within a realistic timeframe or within an existing theoretical framework. In the study, hyperclaiming was avoided by explicitly exposing the goals of the study and by using extracts from data collected. In doing so, the researcher was able to gather and report data for better interpretation. Prior to this data analysis stage, the researcher clearly defined the goals of the study to respondents.

Closely linked to hyperclaiming is the notion of caucism. Caucism refers to a tendency to imply a causal relationship where none had been established or when data do not support it. In the context of the study, there were no specific attempts at attributing causal relationships to antecedents of knowledge transfer in a quantitative fashion such as regression analysis or statistical analysis. Rather, the researcher tried to explore the professionalised context where knowledge transfer occurred and, as such, presented views of participants on issues of knowledge transfer in their local context. In this way, the researcher hoped that the study would contribute to the emerging bulk of studies that also explored the professionalised context of the NHS using similar research methods (Addicott, McGivern, & Ferlie, 2006; Currie, 1999, 2006; Currie et al., 2008a; Currie et al., 2008b; Kumpers, Mur, Hardy, van Raak, & Maarse, 2006; Rashman, Downe, & Hartley, 2005a; Rashman et al., 2002; Rashman et al., 2005b; Robertson et al., 1996).

Finally, Rosenthal argued that good conduct of research should also take into consideration issues of costs and utilities of a study. In the study, benefits outweighed costs because of its contribution to existing KM theory and practice. For example, the

study brought two literatures together in a discussion on knowledge transfer: organisation studies and medical sociology. In addition, the study provided empirical evidence policy-makers could use to understand the notion of knowledge transfer and boundaries. Finally, the research project represented an opportunity for the researcher to undergo doctoral training. This can also be viewed as a benefit for society since the researcher can now use skills acquired as part of his doctoral to conduct research as yet an early career sociologist in the field of organisational issues in public sector organisations (Shulman & Silver, 2003).

Rosenthal also argued that data analysis needed to be conducted appropriately to be ethical and therefore more likely to be of interest to the research community and practitioners. Issues under consideration included data dropping, data exploitation and meta-analysis.

Data dropping would vary from overt to subtle omissions of data for serving the interests of the researcher. Omissions of data are unethical and can have damaging consequences for a researcher. For example, a researcher may be faced with extreme results or findings which, in this case, may provide an opportunity to disregard such findings. If such a thing was to happen, the researcher would need to mention such extreme result in an effort to acknowledge the technical deficiency or the surprise created by such results. In the context of the study, differences across the data were treated as chances to better explore the NHS genetic service investments. As such, differences in findings were relevant to the researcher as they presented an opportunity to highlight variations across cases.

Similarly, the researcher may drop a subset of data as he or she would perceive the data to be irrelevant to the research project. In this case, an ethical way to deal with

this issue is to acknowledge and explain why such subset of data was rejected for the purpose of the study. For example, the researcher did not include data collected from a survey questionnaire conducted after the interviews with nurses. This questionnaire was administered electronically to observe career pathways following nurses' participation in the MG projects. Disregarding this data set was necessary for two reasons. First, the questionnaire had a low number of respondents (n=12) and could not withstand any statistical analysis. Second, the centrality of the research project changed from investigating careers pathways to exploring knowledge transfer and boundaries. Therefore, the researcher was not in a position to draw any possible conclusions from such questionnaire in a discussion on knowledge transfer.

Data reporting can also be subject to ethical issues such as misrepresentation of findings. Misrepresentation of findings can be harmful to the research project. For example, misrepresenting data intentionally can threaten the academic career of a scientist, especially those at an early stage. To avoid this problem, the researcher shared his findings with the research team at supervision meetings. In doing so, the researcher was able to refine his own claims and, at the same time, guarantee that findings were not misrepresented.

4.2.7 Data analysis

Data analysis is a process by which data is broken down and re-organised around key themes. This stage provides the researcher with an opportunity to interpret a context and answer the research questions at hand. It is, in Eisenhardt's view, "the most difficult and the least codified part of the research process" (Eisenhardt, 1989, p.539).

For data analysis depends on the researcher's interpretation of a context. As such, one view the process of analysing as a reflexive process whereby the research tries to make sense of the data collected. Interpretation such data is also informed by previous theories as well as the researcher's imagination in identifying and understanding data collected (Murphy et al., 1998). It is typically based on an iterative process as described earlier in Eisenhardt's case study methodology. This process is further refined at the writing-up stage as the researcher imposes his or her own interpretation and writing style on the context (Van Maanen, 1995). Essentially, data analysis starts with a small portion of data where the researcher generates an initial set of themes. The latter is then expanded as more data gets analysed (Silverman, 2001; Strauss & Corbin, 1998). As more themes are developed and refined, the researcher begins to access to the context under investigation and creates his or her own interpretation of the context. In doing so, the researcher is able to find similarities and differences within cases as well as across cases which will inform the interpretation of the context. In the study, data analysis was analysed in the following way.

First, transcripts of interviews were outsourced to a transcription services company. Interviews were transcribed verbatim and no attention was paid to pauses and other listening cues often used in discourse analysis (Cicourel, 1964).

Second, the researcher examined every single transcript for sensemaking purposes and categorised data according to each question asked at interview stage (Weick, 1988).

Third, the researcher created initial themes to categorise data for each transcript. When a new theme was identified, the researcher added a new category and cross-checked whether other transcripts referred to this new theme.

Fourth, themes were refined and compared across cases to find similarities and differences confirming or refuting the KM theoretical framework described in the literature.

Fifth, the researcher moved on to the enfolding the literature stage of the comparative case study methodology as Eisenhardt suggested. Enfolding the literature means reviewing existing literature to reflect on similarities and differences found in the data. Differences are particularly useful to find variations across cases. In some cases, differences support existing theory or, in other cases, they may simply refute existing theory and call for a new theoretical framework. The final step of reaching closure was then achieved when further analysis of the data were of limited value to findings of the study.

The researcher spent nine months making sense of the data to understand the role of organisational and professional antecedent on knowledge transfer in the MG projects. During that period, the researcher shared his impressions with the research team on a regular basis so that external feedback could help refine interpretation of the MG projects. This supported the researcher in interpreting the context. Making sense of the data was also achieved through the writing up stage of the doctoral thesis as Van Maanen (1995) suggested. This process ensured that data analysis was as rigorous as possible. For some, rigour in data analysis is often achieved through using computer packages such as NVivo. In the study, the use of such packages was rejected for two reasons. The scale of the study did not require the use of a software package. Second, the costs of learning and using NVivo were greater than the benefits associated with using such technology.

Interpretation of findings was assessed against five principles recommended by Murphy et al. (1998).

First, there must be clear exposition of data collection method. In the study, data collection and research methods were described extensively as the previous section on data collection shows. Accurate recording of the events, interviewing external informants, use of an experienced transcriber and a systematic method for analysing data also contributed to this process (Silverman, 2001; Warwick, 1973). Data was also digitally recorded and backed up onto a computer file thus preventing data loss or physical damage. The researcher also reviewed each audio file to cross-check the accuracy of transcripts returned by the transcription company. Interviewing external participants and genetic counsellors also contributed to making the research more relevant to the study of knowledge transfer in the professionalised context of the NHS and the nursing profession. Pilot interviews were also used as a technique to train the researcher on interview techniques prior entering the field for his own research project. Two pilot interviews were conducted at two different empirical sites. In the first pilot interview, the researcher observed the interview process as conducted by his supervisor. In the second pilot interview, the researcher was involved in asking questions to the informant. In this way, the researcher was able to practice his interviewing skills and, at the same time, become more familiar with interviewing skills and data collection.

Second, there must be a clear exposition of the process of analysing data (Murphy et al., 1998). This process was described in the paragraph above. Furthermore, findings were presented in such a way that they fulfil requirements of concept intension and extension. Concept intension refers to "the network of concepts to which any

particular concept belongs. It is from its place in such a network that any particular concept gets its meaning" (Murphy et al., 1998, p.187). Concept extension refers to "what would or would not count as an instance of a given concept" (Murphy et al., 1998, p.187). In the study, the researcher located the research project in a discussion on knowledge transfer and compared findings in relation to such theories. In this way, the researcher was able to locate the study within the network of concepts under investigation (concept intension) as well as discriminate between instances of knowledge transfer (concept extension).

Third, the researcher must be reflexive of his own actions in the research process. Reflexivity means "being sensitive to ways in which the researcher's presence in the research setting has contributed to the data collected and their own *a priori* assumptions" (Murphy et al., 1998, p.188).

In the study, the researcher had no involvement in the MG projects other than as a researcher. However, such role should not be considered to be neutral. Murphy et al (1998) argued that the role of the researcher is not neutral because interviews, just like any other social interaction, can also be subject to a dance of expectations as mentioned earlier. In effect, the researcher had a number of expectations before and during the interview stage of the research project. For example, the need to understand the context of the MG projects represented a first expectation from the researcher standpoint. Given that the researcher, as a non UK-native individual, had no prior knowledge of the MG projects and the UK healthcare system altogether, there was an expectation that knowledge on these two contexts would be gained when interviewing informants. This expectation meant that the researcher tried to compensate for his lack of knowledge by asking questions in lay terms on the role of

the respondents in the context of the NHS genetic services investments. This was picked up by respondents who often described their roles in basic terms rather than their everyday jargon when the interview started. This affected the interview process and is acknowledged in this study.

Furthermore, the face-to-face interview technique also created expectations both from the researcher and the interviewee viewpoints. For instance, social codes of conduct such as greeting the respondent or discussing non-related topics prior the interview also affected the interview. This issue is also acknowledged in this study as both the researcher and the interviewee adhered to such social norms to avoid putting the social encounter at risk. In other words, the researcher did not jump straight into the interview seconds after meeting the respondents but instead provided space for both the researcher and the respondent to get to know each other to be able to converse pleasantly.

Linked to the above, the researcher was also aware of the social desirability bias discussed in the research ethics section of this chapter (see p. 136). Within the context of the study, the bias was reduced by telling participants that the purpose of the interviews was not to generate personal data, but to focus on knowledge transfer, organisational and professional antecedents and knowledge transfer outcomes. Furthermore, each participant was guaranteed confidentiality for both themselves and their organisation. Although this did seem to reassure individual participants, it was apparent that there were elements of social desirability bias impacting the responses which the interviewer could not control for.

Fourth, the researcher must pay attention to negative cases. This was achieved through using Eisenhardt's (1989) case study methodology which also suggested that

researchers should pay attention to differences in comparative case studies. These differences allowed the researcher to draw more informed interpretations of the context of knowledge transfer in the NHS.

Fifth, the researcher must be able to present an interpretation that is not too tainted with personal and moral values. This means that the researcher must ensure that the data has been treated with fair dealing as Murphy et al (1998) suggested. In the study, this point was addressed by interviewing genetic counsellors, educators and a project officer from a professional association. This guaranteed an external opinion to nurses' interpretations of knowledge transfer in the pilot projects. In addition, the researcher exposed findings to his supervisors who were able to challenge the process of analysing and associated findings. This guaranteed trustworthiness of the findings and reduced personal bias. The researcher also used verbatim accounts and precise descriptions in the data chapters to offer readers an opportunity to interpret data for themselves (LeCompte & Preissle, 1993). Overall, the research design involved a number of commitments to remain consistent with the aims and philosophy of the study.

4.3 Chapter summary

The chapter examined the research philosophy underpinning the research project and the methods used to investigate knowledge transfer in the NHS. In particular, the chapter was divided in two sections.

The first section examined ontological beliefs and epistemological stances taken for granted by the researcher. In particular, the researcher made clear that the research was underpinned by a subjectivist ontology and an interpretive epistemology.

The second section described the research design of the study. First, it introduced the context of the study. Second, it discussed the comparative case study method. Third, it described the theoretical sampling method used in the study. Fourth, it examined data collection techniques used for the study. Fifth, it discussed research instruments in detail. Sixth, it described the research ethics of the study. Seventh, it explained the process of analysing data. The next chapters focus on findings of the study.

5 Chapter 5: Organisational antecedents to Knowledge transfer

The preceding chapter discussed the research methods used to address the research questions of the study:

Research question #1: how do organisational antecedents affect knowledge transfer in a professionalised context?

Research question #2: how do professional antecedents affect knowledge transfer in a professionalised context?

Chapter 5 presents findings associated with the first research question. Essentially, organisational antecedents did not facilitate knowledge transfer. As a result, nurses actively engaged in self-directed learning and other more informal, "Do-It-Yourself" learning methods. A direct implication of such finding is that knowledge transfer should be supported at management level if the organisation and nurses are to be benefit from genetics investments. Therefore, the answer to the first research question is that organisational antecedents are significant barriers to knowledge transfer in a professionalised context. More to the point, a professionalised context is made of significant barriers which are not conducive to knowledge transfer as anticipated in generic knowledge management literature.

The structure of the chapter is as follows. First, a section discusses findings related to the perception of genetics from a participant perspective. Second, a section presents findings related to common knowledge transfer practices used across case studies.

Third, a section presents findings association with organisational antecedents of MG projects from a nurse's perspective.

5.1 Nature of knowledge in MG projects

As the literature review indicated, the KM literature often neglected the nature of contextual knowledge even though some argued that this aspect needed to be understood before moving onto issues of sharing knowledge (Foss et al., 2010; Sie & Yakhlef, 2009). In the current study, the knowledge to be disseminated is that of genetics. It is viewed along the following points.

First, genetics is perceived as an emerging science by most nurses. For example, Petra argued that genetics was still at an infancy stage in healthcare delivery systems. As a result, she claimed that there was no consensus as to ways for diagnosing and treating patients. The following extract illustrates the above:

> It's a very emerging science there often is no answers to some of the very easy questions such as how often would you give a patient particular screening or even a consensus. (Petra, nurse)

Second, genetics is said to be complex and difficult to learn as Julia commented in the following extract:

> It is a very specialised area. I think genetics is a really, it is a very difficult area to learn and can become very complex, but I think general clinical genetics would be too overwhelming, but if you work in a speciality where genetics has an impact, there is a good genetic impact, there is a good reason to learn more about it, so we are not just learning clinical genetics per say everything there is to know, I have no idea and don't really have a need to know or want to know say the genetics of Huntingdon's Disease for example, but the genetics of cancer and how it might impact in terms of the risks for

> somebody in terms of their family history, or even taking that a step further, which I think will happen again in the future, is how you can look at the genetic makeup of a cancer to sort out a better treatment, that's going to be massive, it is going to be huge (Julia, nurse)

In the extract, genetics is perceived as a complex area which involves many specialities which Julia has no interest in. It is regarded as "overwhelming" and consequently too difficult to learn. Nevertheless, Julia is of a view that there is a need to learn about genetics if it relates to a speciality, such as cancer in her case, which she claims can be "huge" and "massive" discriminating factors in the future. Therefore, Julia sees the nature of genetics to be highly complex and difficult to acquire yet necessary for helping patients and for the future.

Linked to the idea of complexity is the notion of accessibility. In effect, in some cases, nurses argued that genetics was not easily accessible from an occupational group perspective and this complicated the process of learning about genetics more than they anticipated. For instance, Milla considered genetics to be a "very closed book" as the next extract demonstrates:

> Genetics is a very closed book where genetics for a long time has been very ivory towerish, it is very difficult to get into genetics. The only way you can get into genetics as a nurse is to be lucky enough to get a genetic counselling post and that's the only way that you can get into genetics (Milla, nurse)

In her view, genetics was s a difficult occupational field to move into unless one was "lucky enough" to get a genetic counselling role which the nurse thought to be difficult to achieve in practice. In a different case, this idea of accessibility was explained by a lack of interest from both the general public and a lack of support from the NHS. For instance, Valerie told the researcher that genetics was "a back door

issue" and that it did not present any tangible career progression from a nursing standpoint. The following extract supports this argument:

> I think genetics is still very much a back door issue - well not a back door issue, but an issue that's not at the forefront of people's consciousness, so therefore it is not as valued as some other - like palliative care or going off and doing a degree in psychology or sociology or something like that, from a nursing perspective. So I am not sure from a further career progression how - I think the thing that will probably be more useful to further a career progression is having articles published and speaking nationally and those types of things, the kudos that may go with it, rather than the actual project itself (Valerie, nurse)

Thus, genetics knowledge was viewed as emerging, complex and difficult science to learn. In addition, Valerie was less convinced that there was a career in genetics. Rather, genetics was somewhat more relevant for careers in academia or presenting findings at conferences. In short, genetics was more relevant outside the nursing context since there were limited opportunities in a nursing context. Therefore, there is a view that genetics is yet to become an important part of the nursing knowledge. The following section now examines knowledge transfer processes used within the context of the MG projects.

5.2 Knowledge transfer processes

This section presents findings from interviews with nurses on knowledge management processes used in the context of the MG projects.

Knowledge transfer processes such as creation and transfer of knowledge are central to the knowledge management literature. As such, studies providing contextual analyses and descriptions of knowledge management processes are useful to inform

the KM discipline. For example, this study focused on knowledge transfer since the MG projects represented a unique opportunity to investigate the ways knowledge was acquired and transferred in a professionalised context. By knowledge transfer, the researcher implied methods that aimed at moving knowledge from one entity, groups or individuals to another type of entity, groups or individuals. These include education, training and development as well as the use of evidence-based medicine and the use of information technology tools. Within the context of the study, on-the-job learning seemed to be the most important method for acquiring and sharing knowledge of genetics. Specifically, self-directed learning was the most popular option nurses used to acquire knowledge of genetics. The findings are further detailed in the remaining of the section.

5.2.1 Self-directed learning central to knowledge transfer

Findings showed that nurses used self-directed learning to acquire knowledge of genetics, often using personal resources. In addition, the study found that self-directed learning technique was often used in conjunction with other informal knowledge transfer methods.

5.2.1.1 Self-directed learning and in-house training

Findings show that self-directed learning was often used in conjunction with other informal learning methods such as in-house training. For example, in MGENPCT3, self-directed learning was used in conjunction with in-house training. In this case,

Pam used self-directed learning because she bought books on genetics using "her own money" as the following extract exemplifies:

> I bought a couple of books on genetics, out of my own money because I was interested, which we have in the office (Pam, nurse)

She also learnt about genetics through in-house training because she trained with the genetic counsellor who also participated in the MG project as following extract shows:

> All of our education came really through Patricia and self taught really then as well, picking up as we go along and as you see more patients and ask more questions (Julia, nurse)

Similarly, Julia used self-directed learning and in-house training to acquire of knowledge of genetics. It is worth reminding the reader that both nurses worked on the same team and both trained with the same genetic counsellor. The following extract describes Julia's learning approach:

> As far as the project, we had through the genetics nurse counsellor a sort of introduction to genetics before we started the project and we've done a lot of individual teaching but none of us have got a formal education in genetics...I think we felt that then the knowledge we needed to do the actual role, we were able to get through Patricia, the genetics nurse counsellor… she was very much – and she still is – our link and support and that seemed to work very well… she came here a few times to do some education with us and looking at how you did family pedigrees and things like that. She was our main link for education and support (Laetitia, nurse)

Thus, self-directed learning was complemented by in-house training in the form of observation and classes nurses attended within their local area. Another extract seems

to support the researcher's inference made above as Julia comments on additional skills acquired on the project:

> I have certainly learnt an awful lot just by doing it as the project has gone on, so I think I have developed project management type skills and certainly writing business cases and things like that, learning and develop just through doing the pilots really. (Julia, nurse)

As Julia commented, learning about genetics in the MG projects not only involved learning about the practice of providing genetics services to patients, it also involved learning about other skills such as project management skills as she referred to in the extract above.

Thus, as these extracts demonstrate, self-directed learning was used to acquire explicit knowledge of genetics while in-house training was provided to help nurses acquire tacit knowledge of genetics. Such pattern was also found across other cases.

In MGENTrust1, Milla also used self-directed learning in conjunction with in-house training. The key difference with the previous case study is the sequence in which Milla used self-directed learning and in-house training. As the following extracts show, Milla first trained with specialists involved on the project and then used self-directed learning. The following extract describes in-house training as Milla experienced it:

> We touched on it for half a day in my nurse training, so when we came into the MG project Dr X and Y had devised quite a good education programme for us, which was really good. There was myself and the senior genetic risk assessment practitioner and there were two other genetic risk assessment

> practitioners and we all were at different levels...But it worked very well. We had teaching sessions every Friday with Dr X or with Y. Yes, it was only at a very basic level, but you can take away from that as much or as little as you want and build on it. (Milla, nurse)

As the extract demonstrates, in-house training was provided on a weekly basis (every Friday) with two specialist consultants. However, as Milla explained, much of the knowledge acquired relying upon such method was viewed to be basic as Milla expressed. As a result, Milla thought self-directed learning was useful to acquire more abstract knowledge of genetics. The second extract describes her strategy when using self-directed learning:

> I would go home and do a lot of readings and had quite an extensive portfolio of evidence that I have gathered, but it is specific to what I need to know. We don't need to know everything, we have genetic counsellors and [Consultant X], when it gets out of our realms then everything goes to them, everything that's high risk goes to [Consultant X] and [Genetic counsellor], I think that's basically it. (Milla, nurse)

As the extracts show, Milla was interested in developing a richer understanding of genetics and self-directed learning was useful to develop such "an extensive portfolio of evidence". These extracts are also interesting to the discussion on knowledge transfer because they highlight the issue of paucity of in-house training methods and the necessity for nurses to further engage in personal learning strategies such as self-directed learning to complement knowledge acquired through in-house training methods. As with the previous case study, self-directed learning was focused on explicit knowledge in Milla's case. However, in-house training did not touch upon practical skills as with the first cases mentioned above. Rather, in-house training was focused on basic skills rather than the practice of doing genetic counselling. Therefore, there was no consistent approach to in-house training across cases studied

and it often depended on local resources and what appeared to be relevant for trainers to share with nurses.

Overall, self-directed learning was used for the purpose of acquiring explicit knowledge of genetics whereas in-house training was used to acquire basic skills of genetics and offer an opportunity for nurses to observe colleagues at work. It was most likely to be focused upon tacit knowledge or knowledge to be used in practice. Together, this method represented an opportunity for nurses to become more familiar with genetics both in theory and in practice.

5.2.1.2 Self-directed learning and external courses

Nurses also used external courses in conjunction with self-directed learning to acquire explicit knowledge of genetics. This approach was found in four of the seven cases studied. For example, in GENTrust 7, Tabatha attended a module at a nearby university which, surprisingly, started at the same time as the project did:

> As soon as we started that there was a genetic course and I thought of that straight away so I was able to access the university course straight off to get the knowledge base first. (Tabatha, nurse)

When asked about the relevance of the course in relation to genetics, she described the course to be a specific module about genetics:

> So basically because I had no knowledge I went straight in there and that gave me the knowledge I needed to understand about the genetics. (Tabatha, nurse)

As for self-directed learning, Tabatha described this process to be involving "lots of research" and observation to pick up "quite a lot of the language" as the following extract describes:

> I worked within the department so I picked up quite a lot of the language and understood that and obviously they like me to do lots of research, so the first few months really was spent increasing my own knowledge, looking at research and looking at trends. (Tabatha, nurse)

In another case, Cindy attended courses provided by her local hospital. These "educational days", as she refers to, were tailored to all healthcare professionals with an interest in genetics:

> I did also have some - because the [local hospital] do themselves every year or probably about twice a year, they do update educational days for all genetic healthcare professionals, so I have been to those as well for updates of where we are up to. (Cindy, nurse; brackets added)

As this extract suggests, courses were not necessarily tailored to provide nurses with knowledge they could use on the projects. Rather, such courses were primarily designed to update healthcare professionals on recent advances in genetics. Thus, the audience could have included other genetic professionals which, to the researcher, indicated that knowledge acquired through such courses was less likely to be relevant to the MG projects per se. In effect, it may well be that such knowledge would already be too specific for newcomers given that they catered for a genetic related professionals rather than nurses. In addition, the researcher was also sceptical about the duration and timing of such courses. Thus, these courses were not necessarily relevant to the current context of the MG projects as Cindy illustrated.

This issue of relevance was also reported elsewhere in the data collected from other

cases. For example, in MGENPCT3 Julia thought external courses were more relevant to her nursing context than the MG projects:

> We have done the odd course and the actual regional genetic service runs day courses which we have attended and we keep updating skills that way. (Julia, nurse)

In the extract above, the issue of relevance could also be observed through terms used to describe courses Julia attended to. In effect, Julia referred to her learning experience as the "odd course" which would signal the rather poor level of appropriate courses to genetics in the nursing context.

Such lack of adequate courses proved to be demoralising in some cases. In effect, Ulrika, who searched for adequate external courses and used self-directed learning, was demoralised and vehemently expressed her concern in relation to this problem:

> Yes, I had to learn an incredible amount. My genetics knowledge - my last genetics education was during my nurse training, probably 12 years ago, it was incredibly basic and had never been pulled on for any of my work previously. So I had to update myself on genetics, I had to update myself on the clinical genetics issues, I had to update myself on renal genetic conditions, their inheritance patterns, the treatment, the support group - just an absolutely phenomenal amount of information...I tried to talk to my colleagues but it was very difficult because I wasn't told who I should talk to, so a lot of my learning was being self directed, I have had to pursue it myself. I felt very strongly that in this position I should have some counselling training, there was no counselling training given and I tried to get counselling training (Ulrika, nurse)

In this extract, one can easily understand that much of the nurse's frustration can be traced back to the lack of organisational resources to facilitate learning of genetics. In Ulrika's view, the organisation should have helped her source relevant sources of information for acquiring knowledge of genetics. Instead, she struggled and felt

disappointed with the learning experience as the following extract illustrates:

> In the end I actually had to go to an external source and I completed the training last month, so two years into the project - and I have had very close contact with upset relatives and patients and I have only just got trained, so to me that was a major problem with the project. I can understand it is very difficult trying to work out what was required, but there was no structured induction, there was no structured training, there was no needs assessment and there was no training support and you had to ask, to pursue individual members, really doing you a favour, so that wasn't ideal at all. (Ulrika, nurse)

Overall, cases showed that external courses had limited value to the MG projects because most courses were not specifically tailored to inform and train nurses on the MG projects.

5.2.1.3 In-house training, self-directed learning, external courses and mentoring

The researcher found one case whereby nurses used a broader range of learning methods than the common two-step strategy reported above. In effect, the researcher found that nurses working at GENTrust2 used multiple learning methods to acquire knowledge of genetics. For example, Terry acquired knowledge of genetics using four learning methods. First, she used external courses as the following extracts describe:

> I was very new to the genetics, I did not have any kind of nursing – there was very little knowledge of genetics in nursing because I did not specialise in genetics so I did know very little about it. There was a basic knowledge of it but no kind of good knowledge. So initially they trained me, my boss and my line manager. They initially sent me to Manchester for a three day course in cancer genetics. (Terry, nurse)

Second, Terry used mock sessions with genetic counsellors to sharpen her skills and rehearse real-life situations before moving into her role in the project:

> I used to do practice ongoing pedigrees in my office. I did mock sessions with my colleagues in my department who already were running clinics in different places. They were genetics counsellors. So this really helped me because they then told me what things I needed to correct and how to inform patients and how to react and things like that because sometimes it's very sensitive issues we are dealing with. (Terry, nurse)

Third, Terry used self-directed learning by reading recommended materials as the following extract illustrates:

> My line manager gave me some of the articles to read and she guided me to some of the journals to read and some of the books, so I was like kind of self-directed learning on that so it really helped me. (Terry, nurse)

Fourth, Terry also spent time observing her managers. In doing so, Terry used the Sitting-Next-to-Nellie technique. The following extract describes this process:

> They helped me to mentor, or kind of shadow. I was shadowing them in clinical areas. Whenever they were having a clinic at the [Hospital A] or [Hospital B] about this cancer genetics, I used to go with them and I shared all my line manager and other genetic counsellors to know how they were interacting and how they are collecting family history and how they are drawing family trees and what guidelines they follow to assess the risk and all that. So slowly and gradually I was getting training on that and whatever questions I had, my line manager and boss were there to answer me and help me out. So that really helped me develop my skills. My line manager was always there. (Terry, nurse)

Taken together, these methods provided Terry with multiple opportunities for acquiring knowledge of genetics which she was satisfied with as the following extract illustrates:

> I have rarely seen people who are very very dedicated to their profession and it really appeals to me because I really like those people and I really love to work with them because there is a great learning behind it. (Terry, nurse)

Within the same project, Cindy also used a similar approach for acquiring knowledge of genetics. First, she attended an external course on genetics as indicated in the following extract:

> I did complete a module at [Hospital A]'s in conjunction with [Hospital B]'s for advanced genetics module for healthcare professionals...It was a degree level module and it was just over two weeks and you are assessed in a clinical setting...So it was very much pitched to that, people who are relatively new to genetics and particularly are likely to be a situation where they are making assessments, so that they can - and particularly in things like breast and bowel cancer, which is a very common area (Cindy, nurse)

Second, she used self-directed learning to complement her understanding of genetics as the following extract also highlights:

> I certainly had some genetics knowledge, probably built up mostly through that job actually, in terms of we got every question under the sun thrown really and genetics came up quite a lot. (Cindy, nurse)

Finally, she received feedback from her managers who, in a sense, acted as mentors in relation to genetics:

> every week I had to supervision with a clinician, so we would go through all the patients I had spoken to and it is not done - it is done much more in way where she will say to me 'what do you think, how can you assess that' it is not - she is not just telling me what the deal is, she is asking me to explain why I had come to that conclusion - to help me to learn, to point me to where I could find out more and I think that's just been crucial to the job and that's been

> essential for my learning and that sort of prompt to look at it this way, how would be that way. (Cindy, nurse)

Overall, this case represented a different context to the rest of the cases to the extent that nurses seemed to rely on more sources of information for learning about genetics. More specifically, it is different from the rest of the cases studied because it shows that organisational support had a positive impact on the learning experience of these nurses. It is also an interesting case which differs from the rest because these nurses were newcomers to the NHS in some ways. For instance, one nurse had never worked in the NHS before moving onto the MG projects. Similarly, the other nurse had worked for a healthcare organisation in the UK which also had ramifications with the NHS. However, she did not have previous experience working within the context of the NHS prior the MG project.

Therefore, this case is illuminating in a discussion on knowledge transfer because it demonstrates that organisational support can be useful for those with no knowledge of genetics but also no knowledge of the organisation. It is also an interesting case because it supports the idea that organisational support can have a positive outcome on knowledge transfer in such professionalised context, at least in relation to sharing knowledge to be used in practice.

5.2.1.4 Self-directed learning on its own

Finally, the researcher found two cases where self-directed learning was the only method used for acquiring knowledge of genetics. In both cases, nurses reported different views than those described above. For instance, Sarah, working at MGENTrust1, described self-directed learning as knowledge developed as part of her

nursing career:

> I have just sort of used my experience and knowledge as things have moved on, to keep the service going (Sarah, nurse)

To her, self-directed learning was the most sensible choice given the lack of formal education in genetics as the following extract describes:

> I would have liked to go onto further education with it and perhaps a degree or some other qualification, but nationally there didn't seem to be very much happening with education with genetics. Obviously you need to do a degree first and then - I know that you could do a Masters but I have never got into that (Sarah, nurse)

Overall, self-directed learning was central to knowledge transfer in the MG projects. It was often used in conjunction with other knowledge transfer methods such as in-house training. Nurses often used it to acquire explicit knowledge of genetics. Key to the success in using this method was managers' support in guiding nurses on what to read in terms of genetics knowledge. Cases were no specific guidance was given often reported poor level of satisfaction with the process. Overall, organisational support was seen as instrumental to support knowledge transfer.

5.2.2 Using other Knowledge transfer methods than self-directed learning

There were exceptional instances where self-directed learning was not used, or at least

where participants made no explicit reference to in the study. For example, Tony from GENTrust1 acquired knowledge of genetics using observation and external courses. Tony used Sitting-Next-to-Nellie by observing both a specialist consultant and a genetic counsellor to understand the process of collecting and using genetic information:

> I went to one of the clinics with one of the genetic counsellors and sat and listened to how they got information from people and how they gave them information. She taught me how to do the family history and how to document everything. (Tony, nurse)

In Tony's view, this technique was useful because learning focused on the practice of genetic counselling and on responsibilities associated with doing the job of a genetic counsellor. Thus, it focused on skills and organisational responsibilities of a genetic counsellor. Tony was also one of the few nurses who were able to attend an external course as illustrated in the following extract:

> I went to the Cambridge Genetic Knowledge Park; they actually run some of the models on public health, a Masters course, so they invited me to go to some of the study days on the Masters courses that were particularly genetic focussed. So I went and actually sat in the classroom and had presentations about genetics. (Tony, nurse)

Overall, the study found that nurses invested their own time and effort to acquire knowledge of genetics. To some, this implied reading materials in their own time. For others, this implied attending external courses which were often not relevant to the MG projects. In the end, the study found that nurses were motivated by a sense of urgency when acquiring knowledge of genetics and more importantly by a need to compensate for the lack of organisational resources for helping nurses in their pursuit

of knowledge. The next section examines the role and impact of organisational antecedents to knowledge transfer in the MG projects.

5.3 Organisational Knowledge transfer antecedents

The study focused on the following organisational antecedents to investigate their impact on knowledge transfer in the MG projects: organisational structure, HRM practices, IT and evidence-based guidelines, team-based antecedents and individual antecedents. Findings show that organisational antecedents did not facilitate knowledge transfer. Likewise, the study found no evidence that IT and evidence-based guidelines facilitated knowledge transfer. Surprisingly, the study found that individual antecedents facilitated knowledge transfer. These findings are discussed in the remaining of the section below.

5.3.1 Organisational Structure

Organisational structure did not facilitate knowledge transfer simply because most cases were staffed with only one nurse on site meaning that there was no need for a new organisational structure to be set in place. The researcher could only find one case where nurses worked together as a team. That team was organised around a network-based structure which the literature often regarded as beneficial for effective knowledge transfer. However, it should be noted that such structure existed prior the genetic initiative. Thus, it was difficult to draw conclusions on whether this structure had facilitated knowledge transfer. Instead, what the researcher often encountered was

the need for these nurses to have more organisational structure around their existing team set up. For example, Pam talked about this problem quite often in the interview as the following extract illustrates:

> That was probably a bit - it has always been a bit of a difficulty really that the 5 of us have all been the same grade, so nobody more senior than the other, but it has also been a huge benefit. (Pam, nurse)

As she explained, being part of an autonomous team was both beneficial and difficult. It was beneficial because nurses were granted more autonomy than in a hospital context. At the same time, it was difficult, as Pam mentions, because there was "nobody more senior than the other" which tends to suggest that there was a need for more structure in their existing context. Nevertheless, nurses were able to build closer relationships with primary care general practitioners as illustrated in the following extract when Pam discussed the notion of "inroads" as a way to express the ease of access to GP practices:

> when the Department of Health, Macmillan put calls out for people to put bids in for the project, it just suited us exactly, we were already in post, we were just up for it really and I know a lot of the other sites they employed people specifically, whereas we had a ready made team that were ready to take on and develop everything really and we already had the inroads, we had the inroads into Primary Care, we had the inroads into Secondary Care and also the inroads into the specialist centre, so were just ideally placed really. (Pam, nurse)

Laetitia who also worked with Pam also claimed that her team organisational structure and contacts with GPs were critical success factors for the MG project:

> I think one of the main reasons was because our team only started – it was a unique team and there wasn't an equivalent team in the country and we based our vision on how we saw the service developing on the aims of the cancer

> plan. There's a bit in the cancer plan from 2000 saying about how genetics could be becoming more prominent and I think that's one of the main reasons. We saw the project through Macmillan and thought it was something that we could as a team do as part of our role in primary care. (Laetitia, nurse)

In the other cases, there was no evidence of organisational structure around nurses involved. For instance, Cindy told the researcher that she was running the service on her own:

> I am running this service potentially on my own, I do have another colleague who does help and I am not in a room particularly - I do have people that are doing that with me - I am doing that very much in conjunction with consultants that I work with. So it is very different and you concentrate on just one area, rather than things generally. (Cindy, nurse)

As this extract illustrates, Cindy was communicating with other consultants but did not have anyone else running the service with her.

In GENTrust7, the lack of organisational structure was both motivating and difficult. For instance, Tabatha thought the lack of organisational structure did not contribute to facilitate relationships with some colleagues as she discussed the notion of "one-woman battle" in the following extract:

> There was a great support but it was very much I felt it was like a one woman battle sometimes, it was a case of me moving it forward, it was a case of me carrying it on because people obviously had other things doing, and there is a fair amount of animosity within our 2 trusts and the consultants that I work with (Tabatha, nurse)

This lack of communication was, to her, caused by a lack of organisational structure as the following extract illustrates:

> our structure at the moment is not decided upon, so till our management structure's sorted we can't move onto how our directorate will look like and

> then how we all work within that directorate, so at the moment it's a case of having to wait and see how things go. (Tabatha, nurse)

Overall, organisational structure did not enhance knowledge transfer as most nurses often worked autonomously on the project while interacting with other professionals located outside the projects. Furthermore, when observable, there was no change in organisational structure to suit the specific context of MG projects. Rather, the existing organisational structure remained virtually unchanged.

5.3.2 HRM Practices

The researcher found that HRM practices did not facilitate knowledge transfer in the MG projects. In particular, career development, accountability and line management, rewards and incentives, recruitment and retention were inappropriate or absent in most cases.

5.3.3 Career development

Most nurses felt genetics had limited impact on their careers and were often concerned on the value of such projects into their careers. In short, most nurses were not interested in genetics after the MG projects. For example, Julia, from MGENPCT3, thought there were no explicit career development opportunities in the MG projects. In her view, the project did not lead to a specific career path as the following extract explains:

> the difficulty now is if you go any further the likelihood is you lose patient contact, so I think that's one of the big issues in terms of nursing career progression, because you get to a certain point and to go further you almost have to move away from nursing, you have to become a manager or a teacher, not stay nursing and look after patients. (Julia, nurse)

As the extract illustrated, Julia was uncertain about her career plans. In her view, the project had no impact on her career. Moreover, she did not seem interested in changing her nursing role to another role, especially roles involving genetics. To her, most career moves were uninteresting because they lacked patient contact. So, roles such as nursing consultants or teaching roles were unappealing to her. Nevertheless, Julia was able to see some value in participating in such projects, especially in relation to developing project management skills as the following extract illustrates:

> from the point of career progression now, I think both writing the bid and project managing during the pilot has been brilliant, because it has given me extra skills and - not sort of formally because again, I haven't done any qualifications as such and there is probably things I have done wrong or less well because I didn't have the experience before (Julia, nurse)

Laetitia also shared similar views towards career development plans. In particular, she had no interest into moving into a specialised role in genetics. Rather, she enjoyed her current role because it offered more flexibility and more opportunities to do a "variety of things" as the extract below would indicate:

> I like to do a variety of things. Some people like to concentrate on one, I do lots of things in my role and that's what I like about it. We do education, we do genetics, we do look after patients, so personally I wouldn't want to specialise in that particular area – it would be too narrow for me. (Laetitia, nurse)

As Laetitia explained, the MG project helped her achieve "a variety of things". However, Laetitia had little interest in specialising in genetics because this field was perceived to be "too narrow" for her in terms of future career plans.

Milla, from MGENTrust1, also made no plans of staying in genetics. Rather, she claimed the project strengthened her current role:

> When I came to do this project, I had no intentions of ever staying in genetics… I only came to gain an understanding of what goes on - what else can we offer these families that I see. (Milla, nurse)

Thus, Milla was not interested in career development plans. Rather, it was the opportunity to do a better job as a specialist nurse that attracted Milla to move into the project as the following extract also illustrates when she discusses some of the main advantages of the project:

> the education and the experience that I have had over the past 3 years, I will be able to adopt to any other role that I go in, because obviously I would stay in cancer because that's my love, that's what I know and to be able to do what have done in the past 3 years, not only to gain an understanding of genetics and risk assessment, but leadership skills and management skills which I have developed and obviously working across the professional boundaries, across the network, is invaluable - to be able to take that elsewhere. (Milla, nurse)

Terry, who worked in MGENPCT2, was also less interested in pursuing a career in genetics. Rather, she was only interesting in staying employed in a nursing role. Therefore, her rationale was that genetics or any other field would have been acceptable to her as long it guaranteed full-time employment:

> I can't wait because everyone financially is having some strain and made to work. So I think whatever the options are available I should go for it and not sit back and wait for another opportunity to come because who knows whether I will get this job again or not? I believe that there is a learning in every job.

> You learn so many different things at each job, so I don't feel like there is any kind of drawback to it or not nice things. I think we should keep our options open. (Terry, nurse)

As a result, most nurses were not interested in pursuing careers in genetics. At the same time, nurses did not believe much was being done to provide them with opportunities to work in genetics as the following extract from an interview with Tony shows:

> That's something I had thought about before, but there's not - the genetics department here is quite large but there's not very many opportunities for trainee genetic counsellors. I think they come up very rarely and also I would be taking a drop in standing to go and do that. (Tony, nurse)

As the extract shows, there were limited opportunities to become a trainee genetic counsellor. Moreover such career move would involve dropping in "standing" which could imply loosing few organisational grades or financial rewards such as salaries. Nevertheless, Tony explained that such role was valuable to move "sideways" as explained below:

> I think I felt like I was expanding sideways but it wasn't going to enable me to - it just gave me more knowledge to actually treat those patients in the best way really, rather than helping my career. That's what I think. (Tony, nurse)

Overall, cases revealed that there was no explicit strategy around careers in most MG projects from an organisation perspective. Furthermore, the researcher found that most nurses had little interest in pursuing a career in genetics. As a result, it is not clear whether there was any HRM involvement to provide future career routes to these nurses after the MG projects.

5.3.4 Feedback, line management, performance appraisals

The study found that feedback mechanisms did not facilitate knowledge transfer as most nurses did not have consistent feedback procedures. Moreover, the study found that reporting to two managers or more often inhibited knowledge transfer because it created confusion as to who to effectively report to. As a result, the researcher often found nurses to be unhappy about their line managers in relation to giving and receiving feedback on their performance on the MG projects.

For example, Ulrika from GENTrust2 was unhappy about the reporting process as she commented in the extracted below:

> I can understand it is very difficult trying to work out what was required, but there was no structured induction, there was no structured training, there was no needs assessment and there was no training support…so that wasn't ideal at all. (Ulrika, nurse)

As the extract shows, the project had no structure in place to evaluate performance at work. Nor there were any performance appraisals as she explicitly described below:

> Yes, before we had no appraisals and people are still trying to work out who should do an appraisal on us... So it is trying to find the appropriate person. (Ulrika, nurse)

As the extract shows, the nurse struggled to find an appropriate person to report to. In addition, nurses often felt their nurse line managers lacked knowledge of genetics. In the case of Ulrika, not being able to report effectively to her managers meant that she was not able to "marry the two and explain any delays" as the following extract illustrates:

> The all work very, very differently, clinical genetics works completely the opposite to the renal unit, in that we are an Acute Trust, there is a quick turn around of clinical results, so it was a very steep learning curve and I think what we are trying to do is marry the two and explain any delays. It is almost as if we have to go back and teach the other about the normal working practices, to explain why. (Ulrika, nurse)

In the end, Ulrika became frustrated even though she expected such confusion when moving into her new role as she expressed in the following extract:

> It is very frustrating, but it is something that I knew was part of the role and I think this is the thing in service development that you don't know until you try, it was always going to be difficult. (Ulrika, nurse)

The researcher also found line management problems in the interview with Pam from MGENPCT3. In effect, even though Pam worked as part of a self-managed team, she felt the lack of line management support was detrimental to the effective running of the project. In her view, the absence of line manager meant that there was "no real leadership" in her team:

> nobody was in charge and I was saying that some of that is good and some of that has been bad, yes - so there has been no real leadership, but it has been good that we have all had an equal say in the role development I think, so that's been good. (Pam, nurse)

Furthermore, there were no "performance appraisals taking genetic counselling into account" as she described below:

> no one of us in charge of the other and we haven't - the manager that we have got, it is so removed from the team that they haven't got any clout to say anything about any of us and because we didn't have a project manager, somebody different that was outside of the group, again there was nobody to keep other people in order. Lack of KSF performance appraisals taking genetic counselling role into account (Pam, nurse)

Therefore, the presence of a line manager was felt to be necessary as she mentioned in the extract above. As Pam further commented, a line manager would have helped dealing with administrative tasks:

> Really we could have done with somebody outside of the team - local, so I don't mean anybody national, I don't mean Macmillan or the Department of Health, but somebody local that wasn't part of the community cancer nursing team, that could have just kept things on track (Pam, nurse)

In Pam's case, the absence of line management implied that someone within her team had to commit to such project management tasks. In effect, Julia actively managed the project in addition to her role as a genetic nurse specialist. In her view, this hybrid role was difficult to manage because she did not have experience running a project from a project management perspective as the following extract illustrates:

> Things like for example, the finance, the accounting part, I am not an accountant so I have no idea, but I knew what money we had bid for, I knew what money we had and what money we were needing to spend, but I am not an accountant. (Julia, nurse)

Milla from MGENTrust1 was also unhappy with the confusion caused by having more than one line manager in the project as suggested below:

> There has been a problem with that as well, because of being a nurse, obviously I am accountable to the NMC, so I have to have a nursing line manager within the Trust, I have to have a divisional line manager within the trust, but then I was accountable to Dr X here as well in genetics who doesn't work for my Trust. I am employed by Hospital Y, Dr X and the rest of the genetics here are employed by Hospital Z. So he has an honorary contract with our Trust, but that was quite difficult. Then in the second year of the project my line manager, nursing line manager left and the divisional line manager left, so the Trust has been without a cancer lead nurse for three years, so I haven't had a lead nurse to tap into because the Trust didn't have one and we have changed the divisional manager who really didn't have an understanding of what we did. So that was a learning thing, we had to keep

> going to him and saying 'this is what we are doing, this is what I would like to do' - so it is a bit difficult with regard to the line management. Obviously Dr X is wonderful and really has sorted a lot out and that's been our governance line management really, with regard to the service and with the regard to the patients going through the service. But general day to day Trust issues, we have a line manager in the division. (Milla, nurse)

The confusion around line management meant that it was difficult for Milla to identify someone with relevant skills in both nursing and genetics. Instead, Milla often sought feedback from the consultant she worked with on the project:

> In the first year I had a staff development review with Dr X and with the lead nurse from the Trust, which was wonderful, we had this three way thing, that was fine. But when she left no one really knew who was going to take over responsibility for me. So it has just been Dr X and myself that have done this, but the Trust have just employed a new lead cancer nurse, so if this does get as a service then we will have that to tap into. (Milla, nurse)

A similar observation was made in GENTrust2 with Petra who also reported to the consultant involved in the project:

> I don't think he was my line manager, he was more really the lead, so if we had any issues it was him we went to but because we were very much a self managing department because we had a lack of a manager, we just managed ourself really. (Petra, nurse)

In GENTrust1, Tony also experienced similar problems with line management since her nurse line manager had no involvement on the project:

> No, so that was really difficult. So on a day to day basis I answered to the consultants I worked for, the four consultants, but my annual appraisal for the hospital was done by my line manager who was a renal nurse and she didn't have any knowledge of genetics at all. I had to tell her what the project was about and what my role was, so to that extent it wasn't very useful. (Tony, nurse)

A similar point was raised in GENTrust7 where Tabatha sought support from specialist consultants rather than her nurse line manager:

> I don't necessarily think there's an understanding there if you know what I mean, I have to explain it all myself and hope that she understands it, and I find that very difficult, but to be fair that's my nursing manager, but one of the consultants who's been involved in the project from the beginning she has a great knowledge base, so she's a great support, so she's the one I tend to go to, if I want to do a business plan or I want to start to do this [client] health report that's late, we're just doing that, she is overseeing it and making sure it's all correct in the way it should be written and things, so she's the one really I report to about it, she's the one who's helped me keep the business case going, she's the one that's helped me go forward, so in a way the management structure's slightly different but its' mainly the consortium of interest that's keeping it going. (Tabatha, nurse)

Overall, nurses believed that reporting to specialist consultants involved in the projects was more relevant to gather feedback on performance rather than reporting to nurses who often lacked specialist knowledge of genetics. Furthermore, there was the view that nurse line managers were not in a position to manage nurses on the MG projects because they were also managing other nurses outside the MG projects:

> Because genetics is - or family history is a very specialist service and at the end of the day nurse managers nurse manage a lot of different nursing - a variety - so we have had a lot of - since I came into post I have had 3 different managers, I have only been in post 18 months (Valerie, nurse)

In contrast with the above, the researcher found one case where nurses seemed to be happy with line management. In effect, both nurses working in MGENTrust2 had positive experiences in relation to line management. For example, Cindy received extensive support from her line managers as she described below:

> every week I had to supervision with a clinician, so we would go through all the patients I had spoken to and it is not done - it is done much more in way

> where she will say to me 'what do you think, how can you assess that' it is not - she is not just telling me what the deal is, she is asking me to explain why I had come to that conclusion - to help me to learn, to point me to where I could find out more and I think that's just been crucial to the job and that's been essential for my learning and that sort of prompt to look at it this way, how would be that way… I have never felt I have been left in the lurch or dumped on. (Cindy, nurse)

As the extract suggested, Cindy was happy with the support from her line manager. Similarly, Terry was satisfied with her line managers in relation to feedback:

> Well, my line manager was like every fifteen days or so she was coming to me and asking me how I'm doing, whether everything is fine, do I need any kind of help or any kind of support or do I need to discuss anything. So it was kind of – and her office was open all the time for me so there was no kind of I don't access my line manager for months, it was not like that. (Terry, nurse)

In addition to these regular meetings, Terry had yearly appraisals as illustrated in the extract below:

> Yes, I had formal appraisals. It was a yearly formal appraisal so yes, I had that. (Terry, nurse)

Therefore, this exceptional case is a good example that shows that giving support to employees at line management level can positively affect knowledge transfer. When absent, nurses often sought support from individuals involved on the project, i.e. consultant specialists. It is worth noting that these individuals were not nurses and therefore less likely to provide an overall feedback in relation to nurses performance and the ways their roles fitted into nurses' overall career pathways. Thus, while this solution provided a short-term response to their problems, it inhibited knowledge transfer because there were no organisational mechanisms for nurses to receive consistent feedback for on their involvement in the projects.

5.3.5 Rewards and incentives

The study found that rewards and incentives did not facilitate knowledge transfer. In particular, nurses did not receive any specific financial incentives for moving into their new roles. Instead, some nurses were at a disadvantage when moving into these new roles because they dropped an organisational grade and suffered financial losses. For instance, Pam dropped a grade as the following extract shows:

> We were all employed as G grade nurse specialists and before I took this job I was an H grade, I don't know if you know the grading structure, but they go up in grades. So I actually dropped a grade to take this job. (Pam, nurse)

Tabatha from GENTrust7 also dropped a grade which she attributed to "politics" as she refers to in the extract below:

> So yes, from that I started as a G grade then I got rebanded and I'm now a band 7, I feel it should be a band 8 but that's politics. (Tabatha, nurse)

This issue of politics affecting banding was also picked up by Sarah who argued that specialist nurses as a nurse population was too heterogeneous to be treated on an individual basis from a rewards and incentives standpoint. As a result, she argued that it was expected that some nurses would be at a disadvantage when moving into these roles even though such roles should have been rewarded more because of the surplus of tasks they involved:

> I think it is just generally throughout the Trust, that specialist nurses especially, the roles vary so much from speciality to speciality, that you can't just generalise and I think the people do different things within their role and I think - well maybe financial reasons as well - they like to keep all specialist

> nurses, apart from the lead nurse who has a higher grade, all the rest of the specialist nurses are (Sarah, nurse)

This point was also shared by Petra from GENTrust2. In her view, there was no "equity across the UK" in nursing careers and this resulted in inequalities in terms of rewards and incentives, especially after recent policy reforms such as Agenda for Change:

> I think most of it's been a paper exercise to date with the knowledge and skills framework and the agenda to change, I think it's very early days to see actually how it works, I think we came out very well from agenda to change…but I think the problem with agenda for change is that you don't have equity across the UK , so of course one genetic department or one group of nurse specialists could be doing the same job but you're paid a different band, so that's problematic. (Petra, nurse)

So, it is no surprise that some nurses, such as Sarah from MGENTrust1, felt that the project made no difference financially as shown below:

> Yes, but career wise and financial wise it hasn't made any difference…We did, when we did our job descriptions for Agenda for Change, that was all put into my job description, but it didn't make any difference to the banding that we were put on. (Sarah, nurse)

The researcher also noted that nurses relied upon other explanations as to why their roles were not rewarded adequately. For example, Julia argued that the lack of rewards and incentives was due to the lack of opportunities in nursing:

> It is difficult. Nurse consultant is the only other grading again above, which combines clinical, managerial, strategic, teaching and that's the best option, because you still maintain - and within that career structure there is a clear patient component, you have to spend 50% of your time clinically and that's great, that's the best way to go, but those jobs are very few and far between. (Julia, nurse)

Others mentioned that such roles were unattractive because they created a dilemma from a cost of living perspective as Sarah explained:

> When we were put on the band for Agenda for Change, I was put right at the top of my band, so I can't move any further now… Yes, so I am on the top band, so unless I got another job at a higher grade, then I get a cost of living rise and nothing more. So it doesn't encourage you to go and do a lot of learning. I have done degree modules at the University, not with the genetics but in cancer care and that hasn't made any difference either. (Sarah, nurse)

As a result, the lack of rewards and incentives was a problem to some nurses, especially in relation to levels of confidence and morale as Ulrika mentions below:

> I think I was just so burnt out by the NHS, so I will leave as soon as I can, because I don't feel that the skills you develop in the NHS are recognised or appreciated in any way and that people are just given more and more work. It is all about money really, so in terms of that - I would love to stay in genetics, I find it a fascinating area, but in terms of the NHS, no, I have just had enough. (Ulrika, nurse)

Others were less affected by such lack of rewards and opportunities since, in their views, the MG projects were not sufficient enough to move up a career ladder as the following extract from Milla from MGENTrust1 describes:

> Yes, to have genetics knowledge as part of your role is a wonderful thing to have as part of your role, but I really don't think that that is going to progress people's careers. They will have a better understanding of their role, but you are not going to get a Sister's post on the back of understanding genetics. (Milla, nurse)

Therefore, the only reward nurses could have been expecting was the satisfaction of providing better quality care as Milla argued:

> I think it is probably - although you are not going to suddenly dash up the career ladder, you will get more satisfaction out of the job that you do… And not everyone wants to do that. I know as nurse on a ward who just want to provide the best patient care you can to that patient and to the family. (Milla, nurse)

Therefore, rewards and incentives did not facilitate knowledge transfer because it did not motivate nurses to acquire, share or put genetics into a career perspective. As Petra mentioned, nurses were often coming "out worse off than some" of their colleagues:

> No, money was actually… I think I came out worse off than some of my colleagues because if you again you have to change banding, they came out better than I did when I was in this role, which I knew was going to happen, so I probably chose that at the time, but again I knew it was going to come right at the end, it's not like I made the choice of a higher band or a lower band, it was just an interim thing really. (Petra, nurse)

As the extract illustrates, Petra did not choose to move into the MG project on the basis of better rewards or better incentives. Rather, she described her move to be temporary as she described the project to be "an interim thing really". Therefore, there was no evidence that rewards or incentives facilitated knowledge transfer in the MG projects. A point which Laetitia generalised back to the nursing profession as a whole as the extract below would suggest:

> Well there isn't any financial inducement in nursing at all is there? (Laetitia, nurse)

There was, however, an exceptional case which suggested that the MG projects added value from a rewards and incentive perspective. In particular, both Tony and Cindy found the MG projects to be rewarding both intrinsically (through learning) and

extrinsically (getting another job). For instance, Tony found another job thanks to her manager in the MG project who acted as a referee:

> It's partly because the project was coming to an end and I thought that I'd get more development from this role than from staying in the renal unit where I was doing two or three different jobs …It's actually the same banding as I was before, but it's a full time position and potentially I can expand. (Tony, nurse)

Similarly, Cindy though the project was useful in terms of career prospects:

> I am very interested in project management as well, so if I could combine something like that with something I am very interested in and have the insight that I have gained from past experience, yes, that would be great, I would be really interested in that. (Cindy, nurse)

Overall, rewards and incentives did not create an environment where nurses would be encouraged to share knowledge more than they already were. In effect, the main reason why nurses often took these jobs was to provide better quality care. There was no financial incentive or rewards associated with such roles.

5.3.6 Recruitment and retention

The study found that recruitment and retention policies inhibited knowledge transfer in the MG projects. Essentially, nurses were recruited through word-of-mouth for the most part and had no knowledge of genetics. Then, the short-term nature of the projects limited opportunities for nurses to stay in genetics.

There were problems with recruiting appropriate candidates for the MG projects. For example, Tony explained that her profile was of interest to recruiters because they could not appoint anybody else as the following extract suggests:

> Well when I was first employed I was the renal nurse specialist and they were trying to appoint a genetic counsellor as well to work as part of the project and they couldn't appoint anybody, there weren't any applications. (Tony, nurse)

Moreover, nurses were recruited through word-of-mouth promotion rather than national recruitment campaigns. Nurses often had no knowledge of genetics even this was to be expected given the remit of the projects to educate nurses on genetics. However, such lack of knowledge from the knowledge transfer perspective was problematic because nurses were not suitable candidates as the KM literature often recommended. For example, Julia did not remember doing any genetics in her career or as part of her education:

> I can't remember doing any genetics in my cancer course or my general nurse training and if I did it was a very, very small amount. I have done a little bit since qualifying and working in cancer, but it would have been the same sort of informal - maybe mentioned on a study day somewhere or half a day on genetics as a whole, but nothing very formalised. (Julia, nurse)

Similarly, Milla from MGENTrust1 had no background in genetics but in cancer:

> I had a good understanding of cancer, I have a degree in cancer nursing, so yes, I understand cancer and I understand the patient's journey through cancer, but genetics - absolutely no background knowledge. (Milla, nurse)

Still, she was able to apply to the job because the job description did not require individuals to have a background in genetics as the following extract shows:

> In these jobs when they were advertised they weren't looking for nurses, it was anyone, you didn't have to be a nurse to do this job. (Milla, nurse)

In most cases, the researcher found that nurses were employed because they already worked in the current context of the MG projects or because they knew the specialist consultant working on the project as illustrated in the following extract:

> Yes. I was working here in the genetics department but mainly… involved in the genetics department here I was working in catogenetic services… as a clinical nurse specialist but in head and neck cancer so it was a complete change for me in genetics. (Petra, nurse)

Similarly, Tony from GENTrust1 knew the consultant specialist involved in the project and this facilitated the recruitment process:

> They wanted somebody who had experience of renal nursing… Yes, I suppose so because I knew Professor X from working with him in the renal clinic as a renal nurse. It was suggested to me that it was a role that would suit me really well and would I like to apply? I think there were two other applicants as well who were interviewed. (Tony, nurse)

Valerie was also recruited through word-of-mouth as the following extract explains:

> I was told - I can't remember who told me - somebody told me that this development was happening within Primary Care and one of the GPs who led the service to begin with was also quite interested in getting somebody that he knew. (Valerie, nurse)

Tabatha from GENTrust7 was also new to genetics but her profile was seen to suit the requirements of the role thanks to her nursing background:

> I was very involved with genetics from a clinical point of view and from a support point of view, but didn't have the genetic knowledge, so they sort of felt that maybe I was more of an ideal candidate to lead the project because of

> my knowledge base and so I was accepted to do that on a part time basis rather than full time, they didn't want me to leave this job and go straight to that. (Tabatha, nurse)

As a result of such unclear job descriptions, some nurses were worried about their careers because they did not know how these projects would fit in their plans as the following extract would suggest:

> I had a big dilemma at the time about leaving the job I was doing because it was very short staffed and then going onto this new role, I think the consultant who I talked about, who advised me really, suggested that unless I did increase my knowledge base with regards genetics I certainly wouldn't be able to move on any further really. And also, I mean mainly I think probably there isn't a huge amount of career development left for me but if there was a consultant nurse post that would be, I'd need to have that knowledge base in order to, even apply for it really I think. (Petra, nurse)

To avoid disappointment at the end of the projects, some nurses sought guarantees such as moving into these new roles while keeping their existing nursing role as the following extract suggests:

> So once the project was actually funded I applied for the post, but did it on the understanding that it was a secondment, because at that point in time, when this project started, we didn't know if it was going to be mainstreamed, so it could have been that it had failed and I would have no job to go back to. Does that make sense? (Valerie, nurse)

In another case, nurses were promised management skills and genetics training as Ulrika explains:

> For this job - I felt as if I had management skills, time management skills, I didn't have genetics education and training, but I was reassured when I applied for the position that that would be incorporated in the position and training would be offered. They didn't expect anyone to have my experience and genetics. So that's what encouraged me to go for the position. (Ulrika, nurse)

The study also found problems of retention of personnel due to the short-term nature of the MG projects. For example, Cindy thought the MG project had limited impact for her to stay in a genetics career pathway. In addition, she thought there were few career choices offered to her because of her level of seniority in the NHS:

> I certainly remain very interested in genetics, I am interested to know what other opportunities there are, whether it is just on genetic projects or other things that are so slightly a bit of a side step rather than necessarily going even more clinical, I would be interested to know what other opportunities there are I think… But I have been a G grade, a Senior Sister level for some years, but then whatever you do - unless you keep doing side steps - you are going to pretty much - that's going to be it, because it is not like you have got a great deal of progression unless you go off and manage a unit. (Cindy, nurse)

Terry shared similar views towards the lack of career opportunities in genetics which she attributed to the somewhat early stage of the field and lack of government funding for new posts:

> I think that's a very emerging field to run cancer genetics nurse-led clinics in primary and secondary care settings. That's a very emerging field and there isn't much resources and opportunities or jobs available for nurses… because of the crisis or whatever you know the NHS is going through – so we didn't get enough funding and this project ended and I didn't find any job in genetics so I had to look for some other things (Terry, nurse)

Such lack of career opportunities also affected Terry's choices as the following extract shows:

> I was kind of very enthusiastic to go for a genetics counsellor course to become a genetics counsellor because I'm not a genetics counsellor, I was working as a nurse, a triage nurse, but I was kind of looking forward to become a genetics counsellor but in this pilot project I didn't get an opportunity to move forward in my career ladder because there was only limited funding and I can't go for a full time or half time course with this

> project because they had their target to finish up in two and a half year's time. (Terry, nurse)

For Petra, the lack of funding and fewer jobs after the MG project meant that she had to move back to her previous job:

> I think I'm in a very small field now so there isn't a huge amount of places for me to go really. So I can't see I'd move jobs unless it was to a different department…Yes exactly yes, I mean I am partly back in my old job now because of the under funding. (Petra, nurse)

Others had similar career pathways as they moved into new roles or back into their old jobs. For instance, Tony was able to move into her new role because she had knowledge of clinical trials as the following extract shows:

> When the money for the project came to an end - the money ran out in April - the renal unit decided that it would fund the clinic one day a week and a nurse to work for the clinic one day a week. So that meant I'd been doing three days a week for the renal genetics and two days a week for clinical trials. So when the money came to an end and there was only going to be one day's work, it would have meant doing two or three different roles to do a full time job and so at that stage I decided that I didn't want to do lots of different bits and pieces anymore and so I applied for - because my role had been, I had a dual role in genetics and clinical trials - so when this job came up I applied. (Tony, nurse)

As the extract above shows, the most important point for nurses was to remain in full-time employment rather than move into genetics. Therefore, most nurses were not necessarily concerned about retention issues but often more concerned about full-time employment. This view is best described with Ulrika's extract below:

> I think if you had asked me 6 months ago, I would say it was an opportunity, but we are in the situation where we don't know what's going on with funding, so we are right back at that again. So you feel you are doing a good job, you are getting positive feedback from patients and relatives, but it isn't

> recognised in the funding. So I think that is a very demoralising aspect of it, but the mainstreaming of genetics, in itself, is very difficult when people can't recognise that the staff themselves need training first. I just think it has been such a major insight that you can't teach someone something you know nothing about, but they have expected people to do that. They have said that it is very difficult because people are wary and there isn't much training. (Ulrika, nurse)

Overall, one can say that processes of recruitment and retention were not adequately implemented in the MG projects. Recruitment was made at a local level. Retention was threatened by the lack of funding.

5.3.7 IT and Evidence-based medicine

Where observable, the researcher found that information technology tools did not contribute to facilitate knowledge transfer. Rather, the researcher found that IT tools were seldom used for a number of reasons. First, nurses preferred learning by doing rather than rely on a "piece of software" as Pam argued:

> I think probably instinctively or just because we wanted to know more, we wanted to know more from the beginning, not just rely on a piece of software. (Pam, nurse)

Second, nurses found it difficult having to use different IT systems as Petra found:

> Common problems with dissemination of information for us particularly the computer systems between the 2 trusts…which is that stupid really. (Petra, nurse)

Third, nurses were delayed in using IT tools because such tools were not ready on time as Julia experienced:

> We developed computer software programmes during the project as well. During the time of the project that was probably a nightmare, it was very difficult and really, really slow, but now, again, just as the project has finished, now the software seems to be working very well. (Julia, nurse)

Fourth, nurses preferred input from colleagues rather than IT tools as Julia explains below:

> Probably our judgement I think and I think that's important because when we have been trying to test the validity of the computer software, we couldn't just specifically rely on the computer, we have to be able to back that up with our own, so we have to know what we are talking about as well. The way that the software is developed - initially the idea was that we would be able to use this software literally while we were with a patient, so as you tell my your family history I could be popping it into the computer and then I press a button and it risk assesses you, but actually the development of the software was much slower than that, so we started our clinics and we did everything by paper, so we would actually draw the family history from the patient and their family history questionnaire before we ever went anywhere near a computer. So we would do that and have an idea in our own head, we would compare with the NICE guidance, compare it with the genetic service and then probably at a later date we would be putting it into the computer and now checking the risk assessments. So it is a bit of a combination of both, but we can't - I don't think we will ever - I don't think it would be wise to ever totally rely on the computer system (Julia, nurse)

As the extract illustrated, the nurse was sceptical about using computers. In her view, these technologies helped for triangulation purposes since NICE guidelines were digitally stored. However, she did not see the use of computers to supplant human input since she "[did not] think it would be wise to ever totally rely on the computer system". Rather, she preferred to use a "combination of both" human input and data from computers to adequate genetic assessments. Therefore, the study shows that, where implemented, IT tools did not add any significant value for facilitating knowledge transfer.

Where observable, the researcher found that evidence-based guidelines did not contribute to facilitate knowledge transfer either. Rather, they were perceived to complement human input. Furthermore, evidence-based guidelines were often changed to suit a local context. This process of adaptation was thought to be necessary to suit local constraints of individuals who needed simple information in a short amount of time. Specifically, nurses often changed the content of evidence-based guidelines to translate information in a simple way to colleagues, such as doctors, who often had no time to learn about genetics. For example, Cindy thought these guidelines were "just there" and that "you can't do them without it".

> I think they are just there, those are the guidelines, I am talking about guidelines on patient history, they are there just - they are essential to the job you are doing in terms of your assessment, you can't do them without it otherwise you have got nothing to make a - that's the most current research, so I think that's just something fundamental to the job that you have to go by. If you are talking about professional guidelines, then that's a separate thing. (Cindy, nurse)

Similarly, Julia also thought the guidelines helped her in making her role more formal as described below:

> Prior to the NICE guidance there wasn't really guidelines at all, it was much more like clinical judgement on behalf of the genetic service really and they had some guidelines and that was literally all we had to go on. So the NICE guidelines really helped to add some structure. (Julia, nurse)

However, such guidelines were often adapted to suit the local context or used in combination with other guidelines as the following extract suggests:

> Some of them were based on breast guidelines, they were based on the best they had at the time really, they all kind of drew things from guidelines

> themselves, they weren't really using NICE guidelines or anything like that (Milla, nurse)

Thus, these guidelines often served a validation purpose and were often used in conjunction with feedback from specialist consultants as Cindy explained below:

> any screening assessments are all made on NICE or Amsterdam or other bowel cancer guidelines - they are all done on guidelines and certainly what I have done, certainly with one of consultants is if we have had maybe an unusual situation or a history that's unusual, we have sourced data to try and give that some back up in terms of what we will advise. (Cindy, nurse)

As Cindy says, patient cases were treated using guidelines and consultants input which, as the following extract suggests, remains of utmost importance for making sure that decisions are based on current evidence and savvy knowledge from consultant specialists, especially for ambiguous cases as the extract below suggests:

> You do have situations…where people don't particularly quite fit that or they slightly sit on a cusp between one and another, in which case that's a clinical judgement, but it is not my clinical judgement to make that, but for a clinician to take that decision…I just don't know, thank God I can just hand it to this person, because they are the person - that's what they are paid to do that. (Cindy, nurse)

Terry also shared a similar view and often preferred consultants input rather than guidelines for assessing unclear patient cases:

> These guidelines are of course very useful to me because I was relating to identify patient's risk level whether they are at the low risk, moderate risk or high risk. So there are clear guidelines and some of the things which were not clear to me, my line manager and boss were there to answer me. Sometimes when I was not feeling comfortable to identify the risk level because we are not perfect in everything, so sometimes I was very open and honest to patients saying 'sorry, it's kind of difficult for me to identify your risk level. I have to go back and discuss this in our team, in our department with my line manager and I will get back to you. I will be writing a letter to you which I will let you

> know which risk level you fall into and what kind of management you have to follow. (Terry, nurse)

Finally, the use of guidelines was only relevant to nurses involved on the projects but not to other healthcare professionals which nurses interacted with as Petra explains below:

> they are guidelines, they're not anything anybody has to follow, so it's very much they're at a formative stage and certainly from the primary care angle, I'm sure you've heard about because of my colleagues, there's been such a lack of support really for those, so very much because the GPs don't need to include them in their primary point target setting, whatever they're doing, ticking the boxes, it's not a priority, so there isn't any money coming to open that, so that was difficult. (Petra, nurse)

As the extract illustrates, the guidelines were only relevant to nurses but not GPs who had no incentives to use them. This implies that there were no incentives for GPs to be integrating genetics into their daily routines or any enforceable means for nurses to share their knowledge with GPs. Furthermore, the guidelines were too broad and difficult to use in practice as Valerie suggested:

> there is no real national guideline to say 'if they fall moderately high or moderately low you screen them x number of times in their lifetime' - so we still, in some respects with bowel cancers that are perhaps are a little bit more complex, we still rely on Tertiary Care to also give us some information and we liaise with them quite strongly. (Valerie, nurse)

Thus, neither IT tools nor evidence-based guidelines contributed to make knowledge transfer easier. Instead, evidence showed that specialists input were often preferred for making clinical decisions rather than technology or explicit knowledge forms such as evidence-based guidelines. Taken together, the study found that organisational antecedents did not support knowledge transfer but limited its scope.

5.4 Team-based antecedents

The study found that coordination between nurses and other healthcare professionals such as general practitioners were, at times, difficult. For example, the researcher noted that coordination between nurses and general practitioners were affected by the latter's unavailability or lack of interest as the following extract suggests:

> People are very reluctant to do anything that isn't in their job description and these kind of roles are considered a kind of unnecessary luxury that people don't have to do, so it is quite difficult getting people on board. They have done, but I think that's because I have got a relationship with them from working with them in the past, but it has been quite difficult, but I think that was part of the role. (Ulrika, nurse)

In another case, Pam was successful in sharing genetics knowledge to GPs. However, she found one GP practice to be difficult to access to because GPs "kept cancelling":

> There was one of my GP practices that I didn't get into, but that was more of a - it wasn't because I didn't want to go in or they didn't want me to go in, it was more of a coordination thing, it just never happened, they kept cancelling, so it all went off. (Pam, nurse)

In Julia's pilot project, access to GP practices was also facilitated by having previous ties with GPs. Thus, had there been no contacts, the nurse would have been in a difficult situation having to negotiate access to GP practices. The following extract describes how having previous working relationships with GPs before the projects facilitated knowledge transfer:

> We were using some of the contacts we had already developed, some of them relatively formally. I was already involved in the cancer network work on the basis of the cancer lead, but then also the day to day contact with GP practices, that came on board, but then we were making more new contacts with the genetic service if you like, so it was really trying to pull together all the different people, different disciplines, different organisations to make sure that we were going in the right way. Then setting up steering groups and things like that, so constantly ensure that you have the engagement of all the different various stakeholders, to make sure that the pilot was moving in the right way, that it wasn't just our ideas or what we thought was the way to go, involving everybody else as well. (Julia, nurse)

Similarly, Laetitia was able to access GPs practices and promote the MG project because she worked with the GPs in the past:

> when we were first set up we had to do a lot of networking with GPs, presenting what our service was going to be, so I don't think we would say that we had issues with that because since we started in 2001 we'd already done practice meetings so we'd hope that the GPs would know us by now. So it wasn't as if we were starting a new project, so we weren't meeting people who we'd never met before. (Laetitia, nurse)

If prior contact was not established, nurses used more subtle tactics to get access to GPs practices. For example, Milla relied on other nurses working with GPs in their practices to help her set up appointments with GPs as the following extract suggests:

> Primary Care is quite a difficult thing to crack because it is really difficult to get past the practice managers and get into the GP forum, so we decided we would use the practice nurse forums and take a lead from the practice nurses, which proved to be a really good way of doing it. (Milla, nurse)

In another case, the nurse was able to access GP practices using help from the consultant as illustrated below:

> Our lead researcher which was Professor X, she already contacted those GPs and managers to inform them that this is a new research project and we are

> interested in having this running in their clinic. So whoever showed interest then we started our clinic over there. (Terry, nurse)

Not having time or not knowing the right people were therefore significant barriers to educate GPs and community nurses as this short extract illustrates:

> Not knowing the players in the different areas, so there's really a whole new circuit of people (Petra, nurse)

Therefore, sharing knowledge to primary care members were, at times, challenging. As Tony explained, success often involved diplomacy and negotiation:

> Well like I said coordination, management skills and like diplomacy because setting up the new clinic was quite difficult, from finding clinic space and saying to people this is what we're doing, you know, please refer the patients to us. Quite a lot of diplomacy was involved. (Tony, nurse)

In other cases, access involved turning genetic knowledge into smaller chunks of information so that GPs or practices nurses would understand the purpose of their service easily:

> So what we have done is go out and spread the message and we have also devised a pro forma for practice nurses to fill in when they screen new patients. (Valerie, nurse)

Overall, accessing GP practices to educate GP or nurses often involved negotiation and use of incentives since, as one nurse remarked below, GPs had no "free lunch with this":

> GPs certainly are difficult to access because they don't have a lot of free time and they have what they call protected time where they do education themselves, so you try and get in at that protected time, but because we

> haven't got a rep providing food for them - I know this sounds really cynical but it is a fact of life, they are not as interested because they haven't got a free lunch with this. (Valerie, nurse)

5.5 Individual antecedents

The literature review argued that much of the existing studies often focused on organisational antecedents that facilitated knowledge transfer. Yet, the willingness to transfer knowledge is an important antecedent for facilitating knowledge transfer. As such, individual antecedents are important in the study of knowledge transfer. Here, the researcher was interested in finding out the impact of individual antecedents on knowledge transfer in the MG projects. In particular, the researcher was interested in finding out how motivational factors facilitated knowledge transfer. The study found that individual antecedents played an important role in facilitating knowledge transfer.

First, the researcher was interested in knowing how motivational factors affected knowledge transfer in the MG projects. As the findings below demonstrate, motivation played a significant part in the projects. Most nurses were motivated to move into their new role to provide better quality care to patients and their families. For instance, Pam argued that she was motivated by the new role and all "things like health promotion and cancer prevention" as the following extract illustrates:

> I am very passionate about are things like health promotion and cancer prevention and that sort of thing and I was doing a public health Masters, so that sort of fitted in - that really fitted in with the screening and talking about cancer prevention and stuff, really fitted in with all of that. (Pam, nurse)

Similarly, Cindy thought the project was an opportunity for her to move into genetics, a field she seemed to have a strong interest in:

> Well I was interested in getting involved in genetics anyway, I had made that decision that was an area I wanted to move into so in fact I had just sent off my CV to the genetics unit at Hospital X a few months before, so when this post became available they actually approached me and said 'you might be interested and would you like to apply for the role' and that's how started. (Cindy, nurse)

Getting into a foot into genetics was also the main reason why Terry was motivated for moving into this new role as the following extract illustrates:

> It was my interest in research so that really kind of pushed me and this research, this project, was kind of public health. Public health is my interest, to serve communities, to look for the population needs and all that and that's really kind of interest to me so it really pushed me that I should go for that. (Terry, nurse)

The second reason why she moved into this role was that she expected better career prospects at the end of the project:

> I think it is helpful because as much experience you have, that will help you in your career ladder because when you show your CV, there are so many different areas if you have worked in different circumstances, it's kind of plus points to you to get another nice job. So I believe that where I'm working at present, at the clinical research centre, that will really help me in future to get to the senior positions after getting some experience. (Terry, nurse)

In another case, Julia was motivated about the project because it was a "good way to formalise what [they] wanted to do". Therefore, the motivation came as a result of making an existing activity more formal:

> I saw them and thought we should go forward for them because it is something as a team we had been looking at the genetics thing and it seemed to be a good way to formalise what we wanted to do, what we wanted to move into. (Julia, nurse)

In another case, motivation was triggered by the need to provide better patient care as Tony explains below:

> I think because I thought from what they'd put together in the bid that is was a much better way to look after that group of patients and it was something that I wanted to be involved with rather than - I didn't at that stage see it that it would help me in my career to progress or anything but then I did think that I would gain more knowledge of genetics doing that role. (Tony, nurse)

Similarly, Valerie thought the project was stimulating because it was a "really exciting thing" and because genetics was to become "something very much of the future" as the following extract explains:

> I just thought it was a really exciting thing. It is a new project, it was doing something from its inception, so in other words being there at the beginning and building the service up… Genetics is hopefully going to be something very much of the future and they are going to be using more genetic related data in order to treat different types of diseases and I felt it was a very exciting project to get into and also to change my perspective from being in an Acute Trust to coming into a Primary Care Trust, because I had never worked within Primary Care before. (Valerie, nurse)

Similarly, Tabatha explained that much of the need to take on the role in the MG projects was motivated by the need to provide better patient care:

> I mean I've got big visions as to where this could go it's just a case of waiting and watching and seeing how it could be done, but to be fair it's not about me, it's about the proper service indications and the family members and that's all I'm bothered about, and I think that some of them get a disservice because they don't get the right information and if they can get the right information and think it can help them go through their treatment processes, to help them understand the whole process and hopefully be happier about the disease

> process, a lot of them get quite stressed out by it but really they don't need to (Tabatha, nurse)

In Valerie's view, motivation came as a result of doing something different than her previous roles:

> I wanted to change my career because I had been doing nurse specialist in breast cancer for about 15 years and I just wanted to see whether I wanted to come out of that and do something different. (Valerie, nurse)

Thus, the study found that individuals were attracted to these roles because they wanted to provide better patient care, learn more, be at the forefront of medical advances and possibly improve their career prospects. Without their passion and willingness to learn, such projects would have found it hard to source good candidates. As a result, the researcher concluded that much of the success of knowledge transfer in the MG project was to be attributed to individual antecedents rather than organisational antecedents which most likely inhibited knowledge sharing.

5.6 Chapter summary

The chapter discussed the first set of findings related to the first research question on the role of organisational antecedents in knowledge transfer in the MG projects. In particular, the study found that nurses often considered genetics to be an emerging and complex field of knowledge difficult to gain access in.

Then, the study found that self-directed learning was very popular among nurses because of a lack of organisational support to help them acquire knowledge of genetics. In addition, the study found that learning often involved informal learning

strategies rather than formal education such as undergoing an MSc degree in genetic counselling. Relatedly, the study found that those who attended formal courses were often attending courses within their local context. However, the study found that most of these courses were often not adapted to their new roles nor adapted for nurses to move into the genetic counselling occupation which nurses were moving closer to by moving into these new roles.

Second, the study found that organisational antecedents inhibited knowledge transfer. Essentially, the study found that organisational structure did not play a central role in the cases. In addition, the study found that HRM practices were relatively inappropriate for facilitating knowledge transfer. Finally, where observable, the study found that IT tools and evidence-based guidelines did not affect knowledge transfer. Similarly, the study found that team-based antecedents inhibited knowledge transfer to the extent that some coordination problems occurred in some cases. Surprisingly, the study found that individual antecedents facilitated knowledge transfer because nurses were interested in learning about genetics, mostly to improve patient care.

As a result, the study found that organisational antecedents had no role in facilitating knowledge transfer. Rather, the study found that individual engagement and motivation played an essential role in facilitating knowledge acquisition and knowledge transfer across organisational boundaries. Without such involvement, these projects would have perhaps failed to deliver on their promises.

6 Chapter 6: Professional antecedents to Knowledge transfer

The precedent chapter provided findings associated with the first research question of the study and found that organisational antecedents inhibited knowledge transfer of knowledge as theorised in the KM literature. Chapter 6 is concerned with findings associated with the second research question:

How do professional antecedents affect knowledge transfer in a professionalised context?

To answer this question, the researcher collected data from interviews with nurses and genetic counsellors from the MG projects but also collected data from nursing educators with a genetic expertise and a member from a nursing professional association with an expertise in learning processes in nursing. As the researcher suggested in the literature, analyses of knowledge transfer in professionalised contexts can benefit from views from key professional actors. Specifically, the researcher was interested in interviewing key members of the nursing profession such as nursing educators and nursing professional associations because they also contribute to the dissemination of knowledge in their profession. In the study, the researcher was interested in exploring views from such key members on ways knowledge of genetics was disseminated in the nursing profession.

The study found that professional boundaries inhibited knowledge transfer in the nursing profession. In particular, the researcher found that educators did not believe

genetics were strongly supported in the current nursing educational system. Second, the researcher found that there was limited evidence that genetics mattered when interviewing one member of a leading nursing professional association. Third, the study found examples of client differentiation between consultants specialists/nurses and genetic counsellors/nurses in the MG projects. Finally, the researcher found evidence that the genetic counselling occupation was creating new professional boundaries with the nursing profession by introducing new professional requirements in the form of an MSc degree in genetic counselling for entering the genetic counselling profession. These findings are exposed in greater detail in the remaining of the section.

6.1 Provision of genetics Education in nursing profession

The study found that educators did not believe genetics were strongly supported in the current nursing educational system. Essentially, the lack of genetics in the nursing educational system was due to supply and demand problems. In addition, there was no organisational support for sponsoring formal education in genetics in the MG projects. As a result, there was no evidence that genetics was disseminated appropriately within the nursing profession. Therefore, it was not surprising that nurses in the MG projects could not find relevant courses adapted to their nursing context. The following points are explored in detail below.

6.1.1 Role of formal education in the MG projects

There was no organisational support for formal education in the MG projects. As a result, nurses could not enter the genetic counselling occupation as Laetitia expressed in the extract below:

> If I was going for a genetics nurse position of some kind I would expect to have a formal education in genetics. Obviously this project is very useful but it's at quite a low level. (Laetitia, nurse)

This point of view was also shared by Cindy who also described formal education as a requirement for moving into genetic counselling:

> I am not a formal genetic counsellor - you have to obviously go through training to be an actual formal genetic counsellor, so I am not that. (Cindy, nurse)

For Petra, the issue of becoming a genetic counsellor also involved formal education:

> I don't know, I don't think It's going to – It's not as if I've got a formal qualification in something, it's not as if I've done a….I've only got the experience I haven't got anything else from it. (Petra, nurse)

In addition to lack of organisational support for attending formal education of genetics, nurses were also confronted to a problem of availability of courses in their local area as some nurses described:

> When the pilot first started that was one of the issues that there weren't enough courses out there for cancer genetics, whereas now there are a few more, so that's what we will probably do. (Petra, nurse)

Overall, formal education was perceived as necessary to move into another occupation such as genetic counselling. Without it, nurses thought moving between roles was practically impossible. As a result, some nurses were sceptical about the outcomes of MG projects, which, to them, represented yet another example of the lack of recognition for the use of informal medium for acquiring knowledge in the nursing profession:

> I think nursing has always been difficult in that respect because you can't shift very easily. (Laetitia, nurse)

As Laetitia commented, individuals cannot shift between healthcare occupations. Consequently, the value of "experimental learning", as Laetitia refers to, is criticised as Laetitia tried to comment again in the following extract:

> I get a bit confused with nursing careers because I think often a lot of it is this experimental learning you have where it doesn't always have to come down to courses. I don't know. (Laetitia, nurse)

Overall, the comments gathered from nurses working on the projects are less surprising when taking into account the professional dimension of knowledge transfer. Specifically, when one looks at support provided by key institutions of the nursing profession, one finds limited evidence of a strong support of genetics. Thus, one may conclude that the dissemination of knowledge may not be facilitated and therefore less likely to become an important form of knowledge in nursing.

6.1.2 Genetics in nursing education

Educators did not believe genetics was strongly supported in the nursing educational system. Essentially, educators discussed two kinds of issues related to supply and demand of genetics in nursing education. Such problems were seen to be the main reason why nurses, both students and those in practice, could not benefit from formal education of genetics.

6.1.3 Supply-based problems

The researcher found that supply of genetics education inhibited the dissemination of genetics within the nursing educational system.

First, there was a shortage of qualified staff for teaching genetics at university level. For example, Luka argued that qualified shortage of staff is the reason why genetics is not taught more widely within the nursing educational system:

> I think there is great scope but I think the biggest barrier at the moment is the lack of educators with the knowledge – not only the subject knowledge, but also the ability to teach that subject knowledge and that's a very rare quality, to find somebody who knows about the topic in detail and is able to take that very complex knowledge and make it relevant to the student's experience and to translate it. That's very rare and the worst case scenario is that 'OK, student nurse, OK community nurses, we are doing genetics today' and somebody comes in from a lab – professor whoever, comes in from the lab and he starts talking and bombards them and they have lost it. So you need somebody with the in depth and it doesn't exist in nursing, there are no books on genetics for nursing, there are no articles really about it – there is very little out there really – from nursing, there is a lot of doctoring stuff about it, but not much nursing. (Luka, educator)

Similarly, Katia argued that lecturers also needed to be trained adequately to be able to teach genetics in nursing education as the following extract explains:

> there is a lack of awareness among just educators in general about how relevant genetics is to practice, because I think many have trained quite a few years ago and think of genetics as being very rare, something you don't see very often, laboratory type thing. That isn't the case anymore, genetics impacts on virtually every condition and so what we are trying to do is improve the genetic knowledge, both in the staff and the students. (Katia, educator)

Thus, there is also an issue of "training the trainer" or "staff development", as referred to below:

> Well what I am trying to get up with some staff development, depending on the area… it isn't just one thing and it is trying to explain to the staff all of these interconnected concepts so that they then are able to pass them on to the students that they are seeing. (Katia, educator)

As the following extract illustrates, training trainers was not necessarily well viewed as some educators argued:

> it's a bit like universities asking people to teach about genetics, and all they go 'oh, I never was taught about genetics when I studied or I never saw anybody with genetic condition when I was out in practice so how can I really teach about it, you know I suppose. (Lydia, educator)

Second, educators' teaching role often increased in hours as a result of lack of personnel as some argued. For instance, Dalida argued that shortage of qualified staff increased her workload because her teaching duties increased in terms of hours at her local university:

> In the three years that I have been here, that vastly increased - the education role, because the first year it was two sessions, last year you could say it double, but it was still only four sessions and so far this year I am booked once a month until June. So it an increasing role, but the number of courses have increased as well, that I am asked to teach on. (Dalida, genetic counsellor)

Third, educators had varied educational backgrounds making the provision of genetics more heterogeneous than homogeneous. For example, Denis had a background in biological sciences and nursing:

> I am a lecturer in Biological Sciences. I am a nurse and my main educational background is that I have got a degree in Bio-Chemistry and a degree in Physiology, but obviously I teach nurses across a range of courses here on our diploma/BSc programme and also I am also involved in nursing. (Denis, educator)

And Samuel had a background in clinical biochemistry as he explains below:

> I came into the School of Nursing about 6 years ago now from a background in clinical biochemistry and lecturing clinical biochemistry at X University and so coming into nursing was a very different field for me and I have been in the field for about 6 years now, purely to teach anatomy and physiology, so that's my focus (Samuel, educator)

Fourth, educators claimed that genetics had a long way before becoming an important topic in nursing education in general. For instance, Dalida argued that genetics was perhaps more "talked about" in midwifery than in nursing in general:

> I am not sure in the more general nursing, I am not sure how much genetics is talked about, whereas in midwifery I think it is very different, it is a lot more talked about. (Dalida, genetic counsellor)

In her view, genetics was just a "box" to tick rather than a major focus in nursing education:

> I certainly think, with the Adult nursing at the moment, it is a box they have got to tick and they are doing, I feel, the minimum requirements because - you pick that up from the number of questions students are wanting to ask afterwards and you have got an hour and I can only just get my talk into an

> hour and they are trying to ask me questions and there is just not enough time really. (Dalida, genetic counsellor)

For Katia, universities were struggling with developing nursing curricula. As she commented below, nursing education modules were "very crammed with information" and this made it difficult for other forms of knowledge such as genetics to be taught adequately in terms of hours and in terms of content:

> I think it takes time and it needs to be done very carefully. The modules are very crammed with information, so there isn't – while some people might agree there isn't enough genetic content – without extending the course you can't add in extra lectures. So what I am trying to do is find ways of incorporating the genetic information into what's already existing – for two reasons, one because I can't do all the lecturing, I just physically don't have time and also I think it is important to have the genetic information incorporated into what's happening rather than separating it out. (Katia, educator)

Thus, being able to teach genetics often required negotiation between educators and universities as Katia further commented:

> Yes – at the moment it is still very separate, we are getting it in there and, as I say, I have just reached an agreement for the Common Foundation project to get the resources, but that takes time…."Yes, I started 4 years ago and it is just 3 months – 4 months since I had that agreement, so it has taken this amount of time for it to be acceptable and say 'OK, yes you are not threatening, we will have a listen to what you have got to say' and by the end of the 2 hour discussion it was agreed 'yes, OK that will actually be useful to us (Katia, educator)

This point was also highlighted by Denis who argued that introducing genetics into nursing curricula was difficult because it threatened existing nursing curricula and other courses which other educators were responsible for:

> Yes, I think – and I don't think it is only here, but I think in terms of introducing any new – well genetics is not new, but in the way that the emphasis is obviously new – in any sort of educational course I think sometimes you get resistance because you have a team of people for the curricula and what have you and some people obviously have got their ideas of what should be in and so if you say you want to bring something in then you have to convince them that is why you want it and I think that's a problem that we faced here and I think equally – because I have spoken to people across the country, there is the same thing. (Denis, educator)

For Samuel, genetics was not widely disseminated in the nursing profession because it also required negotiation between genetic educators and other staff members in nursing curricula:

> I think when you write a curriculum, you write it with lots of people involved, coming from different professional and deemed a few points and you come up with a curriculum which will be different – our curriculum will be different to the University of Birmingham or Oxford or Bristol – it doesn't mean to say that each one is not putting in the criteria, but I think different pressures will be exerted, depending on who is informing the curriculum. Particular Universities maybe very strong in genetics or very strong in the bio-sciences, others may be very weak, yet were still expecting the same outcome. Whether or not we should go down the route of a national curriculum or at least clear guidelines what should be included, I think might be a good thing because then the particular focus that we need will be incorporated, because a target has been set. I think that would be quite a good thing, to have a national curriculum. Whether or not we would have one, sort of thing, but I think it would be quite useful to have at least clear guidelines, if not a national curriculum. (Samuel, educator)

Patrice shared similar thoughts and expressed scepticism towards the view that more could be achieved in nursing education to facilitate the dissemination of genetics:

> It is a very small proportion of what we teach them and there are lots of conflicting areas that obviously they need certain things that are mandatory in their training programme, so we have to do things like manual handling, cardio pulmonary resuscitation and lots of other topic areas, so really we have only got a small slot to do genetics in. It has improved because we are committed to genetics on programmes, so we have got reasonable provision, but it is just a small part of their programme and I think by and large, unless they are in an area where they see lots of patients with particular genetics

> problems, often genetics is forgotten about and just seen as a small component of something. (Patrice, educator)

Finally, Denis was also of a view that genetics was not widely disseminated in nursing education and in nursing practice as the following extract illustrates:

> So when you look at applied genetics at the moment, it is not taking place in practice, if you know what I mean, we have always had genetics but putting it into practice has been difficult, people might talk about it but it is not actually a particular part of a programme. (Denis, educator)

Overall, most educators agreed that more could be done to improve genetics in nursing education. Essentially, educators argued that there was a shortage of qualified staff, limited amount of hours and conflicting priorities in nursing education. These problems represent the supply side of genetics education in the nursing profession. Demand-side problems were also seen to inhibit the dissemination of genetics within the nursing profession as the following section demonstrates.

6.1.4 Demand-based problems

Educators also identified other barriers affecting the dissemination of genetics knowledge within a nursing professional context. In particular, educators argued that students were often not prepared or scared to learn about genetics. As Ellen explained, the term “genetics” was sometimes a barrier which nurses and students in nursing had enormous problems with since it carried a scientific connotation which the educator claimed nurses were not accustomed to:

> The biggest barrier we find with nurses is just the word genetics, because then they think it is science - so it is really demystifying it. But we have thought long and hard about other terms we can use instead of genetics and it is very difficult. (Ellen, educator)

Luka also shared a pessimistic view towards nurses understanding of genetics as the following extract vividly illustrates:

> that's difficult because it is complicated and if you have got people who don't know where their kidneys are and at the same time you are trying to teach them some of the genetic stuff and some of the students we do get literally don't know the inside of their own bodies. (Luka, educator)

In Patrick's view, genetics is a "heavier subject area" than the more "touchy-feely" side nursing and this can undermine nurses' confidence as the following extract demonstrates:

> a lot of nurses perhaps lack confidence in science, a lot of them won't always come in with a science background, so we start with the basics and work up, but some do struggle with Biology and genetics is a heavier going subject area. Nursing, by its very nature, is caring and you tend to attract people that are more touchy-feely, than to the sort of psychological side of things, the sociological side and really you obviously need to know about both sides to understand genetics, with the Biology background. (Patrice, educator)

Therefore, as Luka argued, genetics knowledge needs to be tailored to the nursing student population if it is to become an important part of the nursing context:

> If we are just throwing stuff at people, really detailed genetics, hard science, Life Science about genetics…it leaves them cold. But if you can say 'look there is a woman here, her mother had breast cancer at the age of 40, she has had a lumpectomy, she is now worried about her daughter that they can get their head round 'that's why I need to know genetics, because I have got somebody here in turmoil about whether or not they should be encouraging their daughter to have some sort of more testing' – so that's when genetics goes in, if you see what I mean and it clicks with the student, rather than today we have got to do three hours on the structure of genes. (Luka, educator)

Overall, educators argued that universities should allocate more resources in terms of personnel and time to provide an adequate level of genetics knowledge in nursing education. At the same time, educators argued that nurses needed to be more confident with learning genetics. And as one educator, nurses needed to become more knowledgeable about natural sciences so that they could know where "their own liver is".

6.1.5 Other barriers to knowledge transfer

In addition to identifying problems at an educational level, educators and genetic counsellors identified other educational issues that affected dissemination of genetics knowledge in the nursing context, especially in relation to the MG projects.

First, educators and genetic counsellors were concerned about the impact of the newly created MSc degree in genetic counselling upon nursing careers. This problem was also highlighted by Ellen who did not want to see nurses' experiences and knowledge to be considered inferior to newly graduated students of an MSc programme in genetic counselling:

> As a nurse I would find it highly offensive that a newly qualified Mastered person with a Masters in genetic counselling, was thought to be superior to me as an experienced nurse with at least a basic degree, if not more, and going into genetic counselling, because I will have a lot of interpersonal skills that they won't have and I will have a lot of experience in dealing with families with bereavements and with some of the conditions that we deal with, that they won't have. (Ellen, educator)

Second, educators were concerned about the lack of credentials associated with on-the-job learning as experienced by nurses in the MG projects. For instance, Katia sees great value in acquiring knowledge as part of a new role but regrets that it is not recognised at the moment:

> And I think using that in addition to the Agenda for Change or your KSF, you will find staff were more rounded, who will have done extra things, so extra education in genetics, so it is not all the time a part of their job, but they have that information if they are able to incorporate it in and be able to say 'I am not the expert, but I know, from what you are telling me, you may benefit from seeing so and so'. Whereas at the moment I think they are quite a few people who go through and just aren't recognised. (Katia, educator)

Third, educators were concerned that dissemination of genetics would be affected by the idea that it is not used in everyday routines. In other words, there was a view that genetics could not be disseminated in practice because its use was limited to discrete activities such as screening patients in the nursing context:

> I think so because I think that's why, it is not so much lack of knowledge, but if you don't deal with something on a day to day basis you tend to forget. So I think there should be a way of evidencing that they have done genetics and maybe update sessions would also be good, because I do try and get across to midwives - because the first thing they always say is 'what will we see?' and I try and explain that I can't tell you that because there are a lot of very rare genetic conditions. So I think because they don't see them regularly, unless they are maybe working on labour ward or neo natal intensive care, they don't see them. (Dalida, genetic counsellor)

Fourth, educators were sceptical that genetics would become central to nursing practice since it has not historically been supported in the nursing profession. For example, Luka sees the main problem of dissemination of genetics to be related to the fact that there is no history of genetics in the nursing profession:

> I think the problem at the moment is. because there is no history of it really in nursing, there are no resources in terms of people to teach it and to lead it, there are no resources in terms of information out there – all the information out there is medical, around medical stuff. (Luka, educator)

Fifth, educators argued that NHS organisational policies were unsupportive of dissemination of genetics knowledge in a nursing context. For example, Dalida argued that NHS policies created unexpected outcomes in nursing careers as nurses kept "spreading further and further" and were ending up diluting knowledge accumulated over years of nursing experience as the following extract shows:

> to just keep spreading further and further really and are you then diluting the amount of knowledge you have got so you are becoming less specialist than anything, rather than becoming more knowledgeable in all areas? I think that the morale in nursing at the moment is so low that nurses would see that as a cheap way of moving them about really and trying to get them to gain more knowledge, but not receiving any salary for it (Dalida, genetic counsellor)

Similarly, Katia argued that nurses often had limited possible career outcomes because of organisational re-banding and this affected morale as the following extract suggests:

> If you take my career for example, there is nowhere higher I can go within genetics at the moment, unless I become a consultant nurse, which means moving into strategic and political stuff, which isn't my thing. So with Agenda for Change that's it, there is nowhere higher for me to go and I think that's disappointing. If I had had a lower banding, financially I would be at a halt… Whereas before, there was much more flexibility, that if you changed your job, that it would have a different grade. (Katia, educator)

The increasing use of short-term contracts as opposed to long-term contracts or full-time employment was also seen to inhibit the dissemination of genetics in the nursing profession as Laurence explains in the following extract:

> I would say, one of the things that I think happened was that nurses were appointed to these roles relatively short term, many - I know I have spoken to a number of individuals that were quite interested in the roles but they couldn't see where their careers would go on from there and I could quite see the points they were making, there was no sort of career planning or career opportunity beyond that. People often - or a lot of nurses can move into nurse specialist roles or whatever, but then they sort of get confined within that particular specialist area and the opportunity then to develop further can be quite limited and also there is a sense that some individuals, they do want to be able to develop new ways of working and a lot of this wasn't necessarily a new way of working for nurses, it was just working in a new subject area. (Laurence, educator)

Therefore, changes in work patterns and career structure were seen to inhibit knowledge transfer to the extent that nurses were risk averse and would not consider moving into genetics:

> I think it has got huge potential, I think genetics really could be used as a really new example really of really changing roles and looking at different ways of doing things, but as I say, I think people need to feel quite comfortable that there is some sort of career structure in place. (Laurence, educator)

Overall, educators argued that the biggest barriers to dissemination of genetics within the nursing profession were to do with time and money. As Patrice put it:

> I think the biggest barrier isn't a person, I think it is the time and the money is the biggest barrier personally. (Patrice, educator)

As he explains, formal education is costly and often involves a trade-off nurses are not prepared to make:

> I have got people who teach various modules and they have people at the last minute pulling out because they are told 'all study leave has been cancelled because of our funding crisis at the moment' or 'if you want to do your studies, alright I can maybe give you the day off but I can't fund them, so you

> are going to have to fund it yourself'. So it is a difficult time in healthcare at the moment for the funding initiatives and releasing people. (Patrice, educator)

As a result, educators are left with fewer nurses interested in genetics because ward managers cannot afford to pay for study leave:

> We have developed a module in genetics for post-registration staff and in fact we are supposed to start – well we have been running it for the last 6 years, but we have not been running it all the time, because it is going to be twice a year, but the problem is getting enough participants, we need at least 8 – 10 people, but this again will be the problem because – actually at the moment with the cuts within the NHS, it is just sometimes the ward managers can't support the staff to come on the course, because most of them usually it is funded by the Trust, but I think staff sometimes feel that it would be better for it to be funded rather than them being here before we can tell (Denis, educator)

Consequently, educators argued that organisational issues could affect knowledge transfer of genetics in the nursing context. Some educators made recommendations exposed below.

6.1.6 Recommended solutions

First, educators recommended more organisational support to facilitate knowledge transfer within the NHS. For example, Katia recommended that genetic pilot projects be incorporated in the existing organisational structure through establishing partnerships with existing institutions such as the Medical Genetic Service:

> I do think pilot projects have a place, but I think wherever they are being incorporated, must work with the appropriate structures that are already in place. If we were to have a pilot project in this area for genetic nurse counsellors, then it would need to then set up in cooperation with the Medical Genetic Service, so that the person has the appropriate support, access to information that I would have. So for whatever area you are bringing it in, it

> must have the appropriate people on board, in order that it would be incorporated in, rather than having it enforced where people don't want it, are resistant and actually work against it and it just ends up not being as productive as it could be, because I think there is a lot of potential for nurses to take on extended roles. (Katia, educator)

Similarly, Laurence argued that genetics needed to be promoted within education and within practice with clinicians working on a day to day basis with patients.

> I have been very much involved with some of the discussions that have been ongoing and it just takes such a long time to convince people that actually genetics is going to impact on health care, we have got to rethink about the way we educate nurses to take the - or to implement the genetics care into their own practice and also that of working with service delivery groups. It becomes very difficult. One of the things we have noticed in our education based research is that the experienced clinicians, working actually on a day to day basis with patients, they are far more likely to realise the importance of the genetics and how genetics is going to affect health care, than many of their managers for example, which is surprising, the managers don't seem to realise how important it is. (Laurence, educator)

Thus, services should be developed with nurses in mind first rather than being promoted to suit genetic counsellors:

> It is difficult isn't it because from my understanding of some of the different roles that have been developed, there are a few that I know of where - thinking about it, there has been some nurse involvement, but a lot of them there hasn't, until basically the services have been designed and then it's a case of 'well we will employ a nurse to do this'. (Laurence, educator)

If such services were developed with nurses in mind, nurses would be more likely to apply genetics in their local context as Laurence highlighted above and in the following extract below:

> So I think they have had difficulty filling some of the posts because they have been seen very much as short term careers - and I can understand why people think that because nobody is quite clear if they are short term funded posts, in

> many cases - and I do think there are lots of potentials to develop really new ways of nursing, but I think you need nurses on board to help with that and to help develop that, because they often haven't been developed with nurses in mind and with nurses' career structures in mind. I think also there is an issue around nurse education in general, there is no career structure in nursing, it is a big issue. (Laurence, educator)

As Laurence highlighted, the key solution is to change existing career structures as further explained below:

> Well I think it is because - there have been various initiatives to try and get some kind of career structure going for nurses in terms of nurses are in education, they are in education, they become staff nurses or the equivalent of and perhaps ward managers or community managers or whatever, but there is no sort of real progression in terms of - if you look at most of the professions, like medicine, there is a very defined pattern, where education and career development go hand in hand, but that doesn't happen with nursing. (Laurence, educator)

Second, educators recommended mentors be trained adequately to support nurses in their context. As Denis commented, if mentors are trained through one of their courses on genetics, they are more likely to understand genetics appropriately:

> The mentors usually are a trained nurse who has had at least 6 months of practice, but also have come onto the mentor course, they have to do a mentor course before they become a mentor. But it is when they become the mentors, we go over the proficiency that students need to achieve, so therefore if the genetics was part of that, then of course (Denis, educator)

This option was also picked up by Lydia who argued that nurses needed informal support since certificates and qualifications may become irrelevant the more experienced they become:

> I don't know, how do you account for anything that you've learned over the years, you know, 'cause you won't you won't always get certificates and qualifications as you become more experienced. (Lydia, educator)

Similarly, Dalida argued that mentoring or observation strategies could be beneficial for disseminating knowledge about genetics in the NHS:

> I think the way to address the barriers is one of the schemes that the Government recommended, the two year training post or - say for example one was set up in Hospital X, a nurse with cardiology, that was expected a genetic element, would be to shadow me for a while and have links with me and very informal training process whereby you are just liaising with each other closely, sort of mirroring each other really for a while as a learning. (Dalida, genetic counsellor)

Third, educators recommended the use of internet websites for facilitating the dissemination of knowledge of genetics. For example, Katia cited a local initiative that used the internet to provide knowledge of genetics:

> As the KSF framework is incorporating to all our career pathways and our appraisal process, then staff will have to learn more about genetics and I think the challenge will be providing that in a way that's useful. Some of the resources that are coming online, particularly Telling Stories, from the education – the nursing education centre – I think would be tremendous and have great potential. (Katia, educator)

Similarly, Denis uses the example of the internet to talk about a web-based solution for disseminating genetics:

> We are hoping in the future to develop a web sort of learning, so that we could run the course in a website, but that is something – but we have developed a website, a genetic website. (Denis, educator)

Fourth, Agenda for Change policies can help knowledge transfer of genetics if the latter is taken into account within existing organisational career structure:

> I think it has potential, I think it has a lot of potential, I don't think we have seen the impact yet because people are still at the process of being matched and banded, getting their job profiles together. I haven't had my appraisal linked to my personal profile as yet, but I think give it a few years, where people have had more than one appraisal, they are used to the system – I think it has the potential to keep people up to date. (Katia, educator)

Fifth, the dissemination of genetics requires participation of champions. For instance, Denis spent a great deal of energy supporting genetics within his own university as the following extract shows:

> I have been involved with genetics at a national level and I have always wanted to have genetics in our work programme because I know looking at other courses, on the other site from here, it is different. I think we have kept – I think we are already feeding genetics within nursing in the UK at the moment, because I have really been engaged in a lot of road shows, with the culture of genetics, not just for our students, but for staff and also the NHS staff. (Denis, educator)

Sixth, university training and on-the-job training can support nurses willing to acquire knowledge of genetics as Dalida explains here:

> I think the two together would be perfect, if you could do a type of module really in the University, but also shadow a person for a period of time - as I say, training in the regional unit is very good, they do lots of sessions and the consultants are very good as well, they are teaching you as well on a one to one basis. If you go and say 'I don't understand this' they will go through it with you. My understanding that's most important, because I only work with one really, occasionally if they have got specialities I will liaise with others, but they are quite good. (Dalida, genetic counsellor)

To summarise the above, the researcher found that more could be done to support the dissemination of genetics within the nursing educational system. Both formal education and pilot projects are useful but not connected enough to provide a steady output of qualified nurses with knowledge of genetics. In addition, educators argued that current organisational structures and current nursing career structures were not

facilitating career moves across organisational and professional boundaries inasmuch as modernisation policies hoped. Thus, educators are not convinced that much is being done at the moment to facilitate dissemination of genetics within the nursing profession. Key recommendations, in their views, were centred on increasing teaching time and allocating more funding to support both universities and local contexts where projects are introduced.

6.2 Role of Nursing Professional associations

This section discusses findings associated with the view of a member of a nursing professional association. It was hoped that the researcher would be able to gather views from a larger pool of respondents. However, only one respondent was available for interview at the time of the study. Therefore, the interpretation of the interview should be treated with care. It is worth reiterate that the purpose of the interview was not to gather data for generalisation. Rather, the purpose was to gather data to explore views from those who actively participated in the provision of genetics within the nursing profession.

The objective was similar to interviews conducted with educators. In short, the researcher wanted to get an understanding of the role of nursing professional association in relation to dissemination of genetics within the nursing profession. As it will be shown below, the interviewee was confident that genetics was adequately supported by her nursing professional association. However, when touching upon the issue of knowledge sharing processes at use to disseminate knowledge of genetics, the researcher realised that each of the methods mentioned by the participant were largely

informal and more importantly required strong involvement from nurses to be effective. Thus, there was no evidence showing that nursing professional associations played a role in supporting the dissemination of genetics knowledge in the nursing profession, at least in the MG projects. Rather, genetics was viewed as one of many specialities nurses can learn about if they wanted to. In short, learning was dependent upon nurses' willingness rather than organisational or professional support.

Nursing professional associations also played no role in the MG projects. For the most part, nurses had no need to use their nursing professional association to learn about genetics. For example, Sarah argued that, while nurses needed to be aware of their professional codes of conduct to enter the nursing profession, nursing professional associations had no role to play in the MG projects:

> Well I think we all need to be aware of our code of professional conduct and accountability, but all the setting up of the clinics and everything has been done locally through the Trust. (Sarah, nurse)

Similarly, Terry did not seek support from the NMC or the RCN as the following extract suggests:

> No, there was no involvement with the NMC or RCN or something like that. It was just my department who helped me. (Terry, nurse)

In their views, there are almost no resources nursing professional associations can offer nurses on genetics related topics. For example, Petra argued that there are no existing opportunities for learning genetics through nursing professional associations:

> I think the RCN are trying to get a genetics group off the ground but it's so new and it doesn't touch so many nurses, it doesn't touch a lot of nurses lives even though it should do (Petra, nurse)

Instead of relying on major nursing professional associations, some nurses used other medical professional associations where they could acquire knowledge of genetics. For example, Milla hoped to join the Association of Genetic Counsellors rather than the nursing professional association as the following extract shows:

> I also hope to do some work with the AGNC, which is like the genetic nurse forum, to look at coming under their umbrella of professional accountability. I am not sure whether we would get registered like the counsellors, but I would quite like to come under their clinical governance and framework because I am concerned that we want this service out and that people pick this up elsewhere, but there is no one governing this - no one in genetics saying 'hang on, what's going on out there'. So I want to do a piece of work with them to say 'this is what we have done, this is our competency framework, how can we fit in with the genetics work?' really - otherwise there is a fear that we will all be doing our own sweet thing. (Milla, nurse)

In another example, Petra considers the AGNC as a proactive association for supporting genetics:

> it's a very small body so there's probably only 400 genetic counsellors in the UK anyway who belong to the ANGC, but they've certainly been very proactive in actually making sure that changes are taken on board so that their voices are heard, so that's very useful really. Certainly with regard to career structures and the training programme, (Petra, nurse)

Therefore, the study finds that nurses did not use nursing professional associations to learn about genetics. Instead, the study found nurses more likely to use other professional associations closer to either genetics or their medical speciality.

The study also found educators to be sceptical of the role of nursing professional associations in facilitating the dissemination of genetics in the nursing profession. For

example, as Luka commented, nursing professional associations can be central to facilitating knowledge transfer because they set standards for nurse training as the following extract explains:

> It is very difficult – the lead really comes from the NMC, because of their standards, they set down the standards for nurse training, for student training and they specify certain aspects and if you wanted to get genetic competence into nursing curricula – all the NMC would have to do is just to make a directive that all nurses should be – and that would be it. But there is this long history of safety, patient safety and it is so ingrained within the profession and you just cannot break it at all. So every time that there are questions about Life Science exams results, should students pass – the old 'do you want to be looked after who doesn't know where their livers are' (Luka, educator)

However, as Luka commented, nursing professional associations may be reluctant to promote genetics into nursing as it may clash with other important topics such as patient safety. Therefore, educators were not convinced that nursing professional associations were supporting the dissemination of genetics. Rather, and as illustrated in the following extract suggests, educators were of a view that the transfer of knowledge often required championing the cause of genetics at an individual level:

> It is very difficult to know how to really put it on the map for practice, but for me, it needs to come from the nursing body and I think as long as that doesn't happen, I think it is just going to be a new service, I think. Then it will be people like myself who are interested then we will be doing something, then others will just think 'oh, that will be difficult'. (Denis, educator)

This view is also shared by Laurence as she is sceptical about nursing professional association "strategic thinking" which is confusing as "people often can't see where things are leading them and where things are going":

> I think that's a big problem really as well, because the leading organisations in nursing, certainly at the present time aren't good at setting out vision, they

> aren't very good at setting out strategic thinking and so people often can't see where things are leading them and where things are going. (Laurence, educator)

As Laurence described, nursing professional associations are not focused onto the "bigger picture" to the extent that they are not recognising genetics as a key priority:

> They are, but they get very bogged down in lots of different things and I think they don't always see the bigger picture really, is my experience of them. As I say, I can remember talking to them 5 or 6 years ago and saying 'genetics is actually going to be really important in health care' and they were like 'well genetics is nothing to do with nurses' and I just think 'well actually it is'… Now they are beginning - for the first time last year somebody actually contacted me from the RCN and said 'we actually think genetics might be quite important' but that was only because Ministers were talking to senior personnel in the RCN for example, saying 'well what is nursing going to do about genetics?' and apparently she turned round and went 'I don't know' and they started contacting people that were nurses with some views on genetics really, that can be turned on. It is that complete lack of recognition despite everybody - well everybody that I know, that worked in genetic related areas saying to them 'this is going to be really important'. (Laurence, educator)

As such, Laurence perceived nursing professional associations to be, as the above extract and what follows illustrates, less proactive:

> They never seemed to take it on board and I find - it is not just with genetics, I just find that the RCN, the NMC - they are reactive rather than - they don't look to the horizon at all. (Laurence, educator)

As a result, educators were not convinced that nursing professional associations promoted genetics in the nursing profession. This view is at odds with data collected from Dilla who worked as a learning project officer at a key nursing professional association. In effect, Dilla was of a view that nursing professional associations were facilitating knowledge transfer of genetics in the nursing profession. For example, Dilla argued that nursing professional associations were at the forefront of the

learning movement and consistently supported nurses in pursuing knowledge, including those interesting in genetics. The following extract describes this belief:

> It's about us knowing as an organisation what's available out there. Somebody comes in and says 'I want to be a genetic counsellor', well we've got to find out the route that they have to go down to achieve that so it's about you and I might not know all the answers but I can research and find out for people, put them in the right direction (Dilla, Project Officer at a nursing professional association)

In this extract, Dilla perceived the role of the nursing professional association as facilitating individuals' learning efforts. She uses terms such as 'route' and 'find out' to describe the role of the professional association in nursing careers. As the extract illustrates, it is up to nurses to invest in learning and not the RCN or the NHS. This line of thought is therefore consistent with a view that organisations and professional associations no longer have a role to play in supporting staff in acquiring knowledge. Instead, the role of the organisation may be limited to a facilitator's role in helping nurses identify potential topics of interest.

Overall, findings show that nursing professional associations were not viewed to participate actively to the dissemination of genetics within the nursing profession. Both educators and genetic counsellors expressed concerns about their role in the nursing profession in relation to genetics. Surprisingly, data collected from a member of a nursing profession association appeared to contradict the above. Nevertheless, the researcher found that much of the learning strategies nurses could rely on were less likely to promote knowledge transfer across organisational and professional boundaries.

6.3 Client differentiation

The study found examples of client differentiation between professions in the MG projects. As mentioned in the literature review, professions often engage in client differentiation by delegating mundane tasks to other occupations. In doing so, professions subordinate other occupations and maintain their monopolistic position in the system of professions. In the study, genetic counsellors and consultant specialists delegated mundane tasks to nurses who were seen as perfect candidates for overtaking these tasks in the MG projects.

For instance, nurses often argued that GPs had no interest in genetics because these were mundane tasks "they were glad somebody else was doing it and not them" as following extract shows:

> No, I didn't have anybody that was against it at all, they could all see the benefit of it and I don't know if that was just how I put it over to them or if they were just - perhaps they weren't interested in genetics so they were glad somebody else was doing it and not them - I don't really know. (Pam, nurse)

As Pam shows, the lack of interest from GPs was often linked to the lack of knowledge about genetics which Pam was surprised by:

> No, that's right and I think they were - when we did - as part of the pre-assessment evaluations that we were doing on people before, we actually talked about the genetics and the genetic service, we found out that a lot of people didn't know, for example, the incidences, so I think the GPs surprised themselves about how little they actually knew. So I think that reinforced that it is good that somebody else is doing it, because their knowledge was probably less than they thought it was. (Pam, nurse)

Pam also noted that there were instances where the genetic counsellor would not refer cases back to her which she was surprised with:

> Another issue that we didn't realise until the end of the project, which we didn't even consider is that Donna was supposed to have been forwarding referrals that she had received from consultants but she hadn't, so she had kept them and really they should have been coming to us, so we weren't getting all the patients here but we didn't realise that till the end (Pam, nurse)

This extract is interesting because it highlights the extent to which client differentiation occurred between her and the genetic counsellor.

In another case, nurses noted that clinicians were simply not interested using genetics because they are not looking after families but patients on a one-to-one basis. For example, Petra argued that clinicians were "isolated in a bubble" because they did not consider the implications of genetic conditions at a family level. Instead, she argued clinicians were focused on single cases as the following extract demonstrates:

> The clinicians in the hospitals, again I think everyone works very much sort of in an isolated little bubble of what they're doing and they're looking at the patient in front of them rather than looking at the families, so there isn't even a consensus. (Petra, nurse)

As Petra explains, clinicians had no incentives for learning or using about genetics since they were often looking at single cases rather than families as nurses did as part of their job. Petra goes further to argue that this lack of consideration is also caused by socio-demographic changes whereby families have become disparate and less concentrated on single geographic areas. As a result, she argued that clinicians were now less aware of families as a single unit but more likely to treat patients as unique cases. The following extract illustrates this point:

> It's priority and it's lack of knowledge on their part I suspect, and also the fact that genetics, you can't actually do a huge amount to change anything really in the short term… GPs aren't looking after whole families a lot of the time any more, you know, whereas previously they would know a whole family, but now the families are so disparate that they don't notice patterns or trends and wouldn't know what to do about it anyway. (Petra, nurse)

Thus, most nurses believed that healthcare members such as GPs had no interest in genetics and that explained why nurses were "taking work off them":

> Most of the GPs thought it was great because we were going to do a job they didn't have to do. We were prepared to sit with the client, bring them here and sit with them for an hour or more, so they were fine about that as long as you're taking work off them and they don't have to be involved and pay for it. (Laetitia, nurse)

A point that Milla also shared in the following extract when she describes the idea that GPs were happy that nurses were managing genetic services as long as they did not "step on their toes":

> There was a bit of resistance, but once they realised that we weren't there to step on their toes, it was going to benefit their service, they were all pretty positive and came on board and still are very, very much a part of the service. It is really their service, it isn't just ours, it is a whole network service, which took a lot of understanding out there but now people do realise that it is their service. (Milla, nurse)

Overall, there was a view that their service was a cost-effective way of filtering out patients or, as Cindy puts it, a way "to get rid" of patients:

> That's the main premise of the triage clinic, is to filter out - so you are filtering it out at quite an early stage in a relatively cost effective way, to just get rid of (Cindy, nurse)

As a result, nurses were delegated mundane tasks and contributed to the process of client differentiation described earlier. Thus, there was no apparent change in respect to existing jurisdiction rights between specialists and nurses since interesting cases were still being looked after by specialists and uninteresting cases were being looked after by nurses. For example, Sarah argued that her new service was not intended to replace the existing provision of specialist services. Instead, she would view her service as a way to triage patients more effectively. In her view, there was no need for her to get involved in "genetic counselling or anything like that" as the following extract demonstrates:

> We don't get involved in the genetic counselling or anything like that. No, if there is any lady wants to discuss genetic testing, then obviously we will refer back to genetics. So we don't get involved in any of that. (Sarah, nurse)

Similarly, Valerie claimed that her role in the project could be likened to that of a genetic counsellor. However, she argues that she does not "profess to be" a genetic counsellor as the following extract explains:

> The premise of our service is that we are a bit like a triaging service. So we are geneticists and we don't profess to be. I don't know anything about genetics from the point of view of actually going away and screening somebody and how that looks. What we basically do is that we work on a three to four generational family history tree, if we can get that amount of information from an individual….so it was to reduce the burden on screening services, potentially and to reduce the burden on the genetics centre. (Valerie, nurse)

As such, nurses tended to refuse the label of genetic counsellors to the extent that they were not providing a complete genetic counselling service since important cases were still being treated by genetic counsellors. As a result, nurses tended to minimise their involvement to avoid confusion for others such as the researcher in this case. As

Valerie explains below, genetic counselling was a "big word" and she preferred to be viewed as nurse "signposting" patients within the genetic counselling route:

> Genetic counselling is a big word, I wouldn't say we are genetic counsellors, we are not talking to individuals, generally speaking, about going down the genetic testing route. We are advising them that that maybe something that needs to be done when we refer them down to St Mary's, but I think their specialism is testing and genetic counselling, that's what they are there for. So we are more like signposting them down that route, but giving them some background as to what is involved with that procedure. So we are actually preparing them for that, but we are not having a big, long genetic counselling session, prior to them having a genetic test, because at the end of the day St Mary's will make that decision not us. Does that make sense? (Valerie, nurse)

Overall, nurses tended to minimise their involvement and viewed their roles as helping other professionals such as GPs and genetic counsellors. In medical sociology terms, this division of labour is an example of client differentiation as it highlights the intra-professional competition between the genetic counselling occupation and nursing as well as inter-professional competition between consultant specialists and nurses.

To support this point, the study found that genetic counsellors were not threatened by nurses' involvement in the MG projects as they were still held accountable for investigating interesting cases rather than mundane cases. For instance, Dalida sees patients in her "own right" without the support of consultants:

> So day to day basis I see some patients with the consultant or do a pre-clinic visit prior to being seen by the consultant to gain information, access hospital records, draw up a pedigree. Certain conditions I see in my own right without the consultants seeing and we have an agreed list and that comes from the regional unit's agreed list - so chromosome abnormalities, cystic fibrosis screening, haemochromatosis - I think that's about all. (Dalida, genetic counsellor)

In addition, the researcher found that the emergence of the AGNC tended to reinforce professional boundaries between nurses and genetic counsellors. For example, Dalida argues that the AGNC is very active in supporting the genetic counselling occupation by strengthening barriers to entry in the profession:

> Yes, but I do think it is a very good organisation and the conferences that they organise are very beneficial and it is a good way for networking with other genetic counsellors and even the group e-mail that they have set up, I have found that very helpful and things that you think 'well I am not very sure how I will go about this' you can e-mail and find other people have already done it and set it up - when you could start from scratch researching it and 'how am I going to do this' - you find somebody has already worked it out. (Dalida, genetic counsellor)

So, when observable, the researcher found that a set of professional forces inhibited knowledge sharing between occupations. More specifically, the researcher found that education, nursing professional association and client differentiation all contributed to inhibit knowledge transfer. As a result, the blurring of boundaries between doctors and nurses as anticipated by policy-makers was less likely to take place. Rather, the boundaries between these professions were reinforced. In addition, the emergence of the AGNC as a new professional association for genetics counsellors would suggest that intra-professional competition was less likely to favour nurses who participated in informal learning such as the MG projects. Instead, such recent developments would indicate that new professional boundaries were being created for members of the genetic counselling occupation to distance themselves from nurses who use genetics within their existing roles.

6.4 Chapter summary

This chapter discussed findings related to the second research question on the role of professional antecedents in knowledge transfer in the professionalised context of the MG projects. Data collected from educators, genetic counsellors, nurses and member of nursing professional associations show that professional antecedents inhibit knowledge transfer of genetics in the nursing profession. Respondents believed that there was poor educational support for the dissemination of genetics in nursing education. Similarly, the researcher found that nursing professional associations were considered to be unresponsive by most of the respondents in the study. Meanwhile, the researcher found that the genetic counselling profession was actively engaged in strengthening barriers to entry in the genetic counselling occupation with the newly introduced MSc degree in genetic counselling. Finally, the researcher reported evidence of client differentiation between nurses and genetic counsellors as the latter delegated mundane tasks to the former. The next chapter will examine the relevance of the findings in the theoretical discussion on knowledge transfer.

7 Chapter 7: Discussion

Chapter 5 and 6 presented findings of the study in relation to the research questions on the role of organisational and professional antecedents to knowledge transfer in the professionalised context of the NHS. The objective of Chapter 7 is to discuss the findings of the study in relation to the existing literature. The literature review identified two research gaps. First, there was a lack of empirical studies exploring organisational antecedents in a professionalised context. Second, there was a lack of empirical studies exploring professional antecedents of knowledge transfer in a professionalised context. In response to these research gaps, the researcher proposed to study two research questions for the study in the context of the NHS:

Research question #1: How do organisational antecedents affect knowledge transfer in a professionalised context?

Research question #2: How do professional antecedents affect knowledge transfer in the nursing profession?

Essentially, the study found that organisational and professional antecedents inhibited knowledge transfer in the context of the projects studied in the NHS. In short, the boundary between doctors and nurses was not changed nor blurred as policy-makers anticipated. Knowledge sharing took place at a local level rather than an organisational level because nurses often relied on self-directed directed learning to acquire knowledge about genetics. Furthermore, the study found that the

dissemination of genetics in the nursing profession was difficult because of lack of time and resources to support nursing educational system and nursing professional associations. Finally, the study found examples of client differentiation between nurses and specialists of genetics since the latter delegated mundane tasks to the former. In doing so, the boundary between specialists and nurses remained difficult to remove in practice.

The plan of the chapter is organised as follows. A first section summarises findings associated with organisational antecedents and its relevance for the extant KM literature. A second section examines the findings associated with knowledge management processes used in the study and the existing literature. A third section discusses findings associated to professional antecedents and the existing KM literature.

7.1 Organisational antecedents and knowledge management

The study was concerned with exploring the impact of organisational, team-based and individual antecedents onto knowledge transfer. As findings illustrated, organisational antecedents often inhibited knowledge sharing even though individual antecedents facilitated knowledge sharing, especially when acquiring knowledge of genetics. In effect, learning about genetics often involved often self-directed learning rather than formal organisational means such as sponsorship for study leave.

First, the KM literature suggested that structural changes were essential to facilitate knowledge transfer in organisations, especially changes towards network-based organisational structures. Essentially, the KM literature often argued that network-based organisational structures facilitated knowledge transfer in organisations because individuals were more likely to collaborate in such structures than in bureaucratic organisational structures organised around functional structures such as departments or divisions (Ackroyd, 1976; Duguid, 2005b; Kogut, 2000; Nelson, 2001; Nohria & Eccles, 1992).

In the current study, organisational structure did not facilitate knowledge transfer. In most cases, there was no organisational structure as nurses often worked autonomously in the MG projects. Furthermore, even when such organisational structure was in place, knowledge transfer depended on nurses previous relationships with doctors and specialists rather than the cross-functional nature of the MG project to acquire and share knowledge of genetics. Therefore, it was the existence of the team and its interaction with the wider medical community that contributed to the success of the project since nurses were known by their colleagues before the project started. Thus, the study lands support to recent critiques on the modernisation agenda of the NHS as it is suggested that policy-makers move away from organisational structural reforms for facilitating knowledge transfer (Currie *et al.*, 2008a; Currie *et al.*, 2008b). For example, the study supports Currie et al. argument that structural change to the NHS would not necessarily encourage greater interaction among healthcare professionals in the NHS (Currie *et al.*, 2008b). In effect, this study is in line with Currie et al critiques on NHS modernisation policies in the knowledge

transfer debate because it critiques policy reforms based on structural changes. More to the point, the researcher is sceptical on the effect of structural changes upon knowledge transfer initiatives given that they have a marginal impact on the existing organisational boundaries of the NHS. In other words, the researcher is of a view that the NHS organisational reforms based on restructuring layers of management or blurring boundaries between professionals may be unresponsive to existing problems such knowledge transfer issues highlighted in the study.

Similarly, the literature claimed that culture was a vital aspect of knowledge transfer and recommended structural changes to change organisational culture. In the study, moving from a traditional structure towards a network-based approach in the MG projects did not change the dynamics of the relationships between doctors and nurses. Essentially, the professional culture resisted structural changes because nurses were still subordinated to doctors and specialists albeit in a subtle way. As such, the study is consistent with medical sociology themes of medical dominance and its impact on healthcare systems (Åkerström, 2002; Allen, 2001; Dingwall, 1977, 1993; Eastwood & Jenkinson, 1997; Freidson, 1971a, 1976b; Goldman, 1999; Hindmoor, 1998; Jewson, 1976; Larkin, 1978, 1988; Lewis, 1911; Pickstone, 2002; Pickstone et al., 1984). The existing professional culture that exists in the NHS was less likely to be affected by such projects because the latter did not change professional boundaries between occupations. Furthermore, such projects had a limited life span that it was difficult to see how changes would materialise. Had such project been funded on an ongoing basis, there could have been some changes, at least from a structural point of view.

There were also no tangible career outcomes from participation in the MG projects. Nurses did not leave their nursing profession to enter a genetic counselling occupation after the MG projects. Similarly, the study showed that a flatter nursing career structure often acted as a disincentive as nurses were not interested in moving up the career ladder. For most of them, career opportunities were few and demanded more knowledge than genetics. This finding is therefore in contradiction with previous studies. In particular, the study is in contradiction with studies emphasising the use of flatter career structures for facilitating knowledge transfer (Holbeche, 1995; McKinley, 1992). In effect, team boundary spanning - described as teams coordinating work and efforts across organisational and professional boundaries- may be less relevant for facilitating knowledge transfer in professionalised contexts than anticipated (Marrone, 2010). Furthermore, such use in a professionalised context such as the MG projects can have adverse effects such as limited career opportunities. In the study, most nurses had limited career opportunities. Yet, there were acquiring knowledge of genetics. Thus, the researcher noted a pernicious effect within knowledge transfer which did not favour nurses in relation to taking advantage of new knowledge from a career standpoint.

Finally, commentators often argued that acquiring knowledge could improve career prospects, especially knowledge acquired in the workplace (Bird, 1994; Bouteiller and Gilbert, 2005; Defillippi and Arthur, 1994; Kuijpers and Scheerens, 2006). Yet, findings show that knowledge, especially knowledge acquired in the workplace, did not play an important role in improving careers prospects. Thus, this study is not

consistent with the previous set of studies that recommended the use of informal learning to improve career opportunities. Rather, these findings are consistent with another branch of sociology, that of education, which argued that careers and knowledge may not be strongly related. In short, there is an argument that education, whether formal or informal, may not enhance career prospects (Collins, 1979). Knowledge and career prospects did not appear to be related as nurses often went back to their previous roles rather than move into a genetics-related occupation such as genetic counselling. As a result, this study brings more evidence that knowledge transfer was inhibited by professional and organisational boundaries. One of the major boundary as discussed earlier was the professional hierarchy which prevented nurses to move into a new occupation.

Second, the literature review argued that HRM practices could play an important role in facilitating knowledge transfer if the following activities are configured adequately: Training and Development, Feedback mechanisms, Rewards and incentives, Recruitment and retention and workforce planning.

In relation to feedback mechanisms, the literature recommended clear and systematic accountability processes, clear lines of authority, especially at line management levels, to facilitate knowledge transfer. Essentially, the argument was that clear feedback mechanisms facilitated the sharing of information for evaluating performance at work as well as improve interpersonal relationship and career opportunities (Blau, 1999; Granrose *et al.*, 1987). Similarly, studies found the role in line management to be essential for improving feedback of employees (Hirsch and

Jackson, 1995; Leibowitz and Schlossberg, 1981; Mayo, 1991; Renwick, 2003; Schein, 1978).

This study supported such previous studies because the lack of support from line managers inhibited knowledge transfer between nurses and line managers. Therefore, the study showed that feedback is an important organisational antecedent for facilitating knowledge transfer within an organisation. In addition, the study raises another point which is that of the expertise of line management in evaluating knowledge. In effect, the study found that nurse line managers were often seen as unable to assess nurses' performance in the MG projects. Typically, nurses did not believe their line managers had sufficient knowledge of genetics. Some even claimed that their nurse line manager had no knowledge of genetics. As a result, nurses often felt the need to gather feedback from other healthcare professionals such as consultants or genetic counsellors. In doing so, nurses were able to acquire knowledge of genetics more than with their nurse line managers. In doing so, nurses engaged in processes which were not formally recognised in existing organisational feedback mechanisms.

As a result, the study raised an issue around the capacity for line managers to evaluate their employees. In the context of the study, having more than one manager or reporting to individuals outside the functional hierarchy of the organisation proved useful for immediate action to be taken within the context of the MG project. However, one needs to be concerned about the long-term organisational consequences of such actions. In essence, the literature often suggested that line managers were more knowledgeable than their subordinates and that they could provide effective support in terms of best practices and career opportunities (Renwick, 2003). In other

words, they are best suited individuals for evaluating and counselling employees on performance and career related issues. However, as this study shows, employees may be more knowledgeable than their subordinates on a particular aspect of a role. Furthermore, other professional members might be more knowledgeable than line managers. These pose problems for evaluation of knowledge from a line manager perspective. In short, if a line manager does not know about one aspect of a role of her subordinate, then such line manager is less likely to provide effective feedback on ways to improve practice and career opportunities. As such, this study contributed to recent studies which illustrated the lack of involvement from line managers and threats associated with such problems from a career and knowledge perspective (Yarnall, 1998). In effect, this study would be consistent with previous studies such as that of Yarnall's which tended to suggest that line management involvement in HRM activities were more of rhetoric than reality.

The literature also argued that adequate organisational incentives could improve knowledge transfer in an organisation (Cabrera *et al.*, 2006; Deckop *et al.*, 1999; Nelson *et al.*, 2006). In the study, there were no financial incentives associated with moving into the MG projects. Worse, some nurses were paid less or lost an organisational grade when moving into their new roles. As such, findings contradicted current KM literature on that aspect. In the study, nurses were motivated for other reasons than financial incentives. That is, nurses were motivated by the opportunity to improve their level of service to patients and families. To some, this objective was more important than personal wealth. As a result, the study also contributed to a debate on whether pay contributes to improving performance in a nursing context (Heyes, 2005; Nelson *et al.*, 2006). More to the point, the study contributed to

research by supporting the argument that pay may play a minimal role in motivating nurses at work. As the study shows, nurses often claimed to be more concerned with improving patient care than with earning more money. At the same time, the study also supported the other side of the argument by demonstrating that financial rewards should perhaps be taken into consideration since the study showed that some nurses were not happy with squeezing new roles into their existing nursing practice and not getting recognition for it. Therefore, while patient care represented the most important reason for moving into the MG projects, it was not necessarily accepted nor greeted with enthusiasm from a rewards and incentives standpoint.

The literature also argued that recruitment and retention strategies were essential for facilitating knowledge transfer in organisations. The study showed support for this argument. Recruitment policies did not attract suitable candidates. Job descriptions were vague. And recruitment often occurred at a local level rather than a national level. Thus, recruitment policies were far from optimal from a knowledge management perspective.

Retention policies were also inhibited by the short-term nature of the MG projects which were funded for two years on average. As a result, nurses were not able to stay in their new roles past the funding period and some were not able to move into a different role involving genetics. Rather, a majority of nurses went back to their previous nursing roles at the end of the project. Or some moved into a different role involving a different set of skills than the skills acquired on the MG projects.

Thus, this finding is consistent with previous studies on retention and knowledge management issues such as the problem of retaining and appropriating knowledge within the boundaries of the organisation (Hislop, 2003; Huselid, 1995; Kamoche &

Mueller, 1998). In particular, it is consistent with the argument that retention of employees contributes to knowledge transfer within the organisation. Employees that remain in post for a substantial period of time are more likely to represent valuable assets for an organisation willing to facilitate knowledge transfer. In funding MG projects for a longer period, nurses are able to develop their knowledge of genetics but also contribute more to the organisation as other healthcare members can benefit from their knowledge of genetics on an ongoing basis. When such posts are no longer funded by the sponsoring institutions, knowledge of genetics is not shared as nurses no longer use it as part of their interactions with other healthcare members. In short, knowledge is lost as nurses are not in a position to use it on a daily basis.

Finally, the literature argued that workforce planning could facilitate knowledge transfer. Essentially, the idea is to ensure that the organisation has a suitable pool of employees to meet present and future business objectives. In the study, the lack of funding for most of the MG projects inhibited workforce planning. That is, there was no planning from a career development perspective. Therefore, the study supports the argument that appropriate career development plans can help facilitating knowledge sharing within an organisation. In other words, the study supports the view that employing individuals in an organisation on a long-term basis provides more opportunities to share knowledge than having individuals working on short-term contracts.

Overall, HRM practices did not support knowledge transfer. Organisational feedback was missing. Rewards and incentives did not improve knowledge transfer. Recruitment and retention policies were not suitable to facilitate knowledge transfer.

Linked to the above, workforce planning strategies did not facilitate knowledge transfer. Thus, more attention should be paid to HRM practices should managers want knowledge to be facilitated within their organisation as other commentators argued (Foss et al., 2010).

Information technology tools are also regarded as facilitating knowledge transfer in an organisation and the KM literature is replete with studies suggesting the above (Alavi *et al.*, 2001). In the study, information technology played little or no role for facilitating knowledge transfer in the MG projects. Either information technology tools were not delivered on time or they were used as back-up tools in clinical decision-making. The reason most often cited by nurses was that doctors' clinical judgement had more power than IT tools for helping the clinical decision-making process, especially when confronted with difficult and ambiguous patient cases. This finding is consistent with previous studies (Currie *et al.*, 2004; Currie *et al.*, 2008c). In effect, these studies showed that IT tools often did not facilitate knowledge transfer as other studies tended to argue (Alavi *et al.*, 2001; Brusoni *et al.*, 2005; Greenhalgh *et al.*, 2004).

The study also considered the relevance of evidence-based guidelines such as NICE guidelines in relation to transfer of knowledge and found that these guidelines were often adapted to the local context as previous studies also found (Dopson, Locock, Gabbay, Ferlie, & Fitzgerald, 2003; Learmonth, 2000; Leicester, 1999; Mead, 2000). In effect, when discussed at interview stage, the researcher found that nurses often simplified such guidelines for GPs or other primary care employees such as community nurses. This simplification process was intended to suit time constraints

nurses were faced with when visiting GPs at their practices. Therefore, the study lends some support to previous studies that demonstrated the difficulty in implementing evidence-based guidelines within the NHS (Armstrong, 2002; Dopson, FitzGerald, Ferlie, Gabbay, & Locock, 2002; Gabbay et al., 2004).

The literature suggested that team-based antecedents could influence knowledge transfer. Team and interpersonal antecedents such as team characteristics and processes, coordination facilitation, diversity of team members, social networks and cultural characteristics were said improve knowledge transfer in organisations.

In the study, coordination between nurses and GPs organised as cross-functional teams often depended on existing relationships rather than the MG projects. Thus, the study contributes to a literature highlighting issues associated with working across organisational and professional boundaries (Currie et al., 2008b; Currie et al., 2008c; Procter & Currie, 2002; Scarbrough et al., 2004; Zarraga et al., 2005). For example, findings are consistent with Zarraga and Bonache's study on self-managed teams to the extent that it shows that teams with a supportive context create and share knowledge better than those with no supportive context. Similarly, the study shows support to Scarbrough et al. (2004) study on project-based teams to the extent that it demonstrates that learning is often difficult to share beyond the scope of a project-based team. Finally, findings are consistent with Currie et al. recent studies highlighting coordination problems associated with working across organisational and professional boundaries. As such, the study is consistent with the argument that knowledge transfer is difficult in settings where little similarity among team members

can be observed. In short, partner similarity is important for knowledge sharing as some studies emphasised (Darr *et al.*, 2000).

The literature also argued that individual antecedents such as motivational factors, perceived benefits and costs, interpersonal trust and justice, individual attitudes could facilitate knowledge transfer. The study supports the literature. In effect, nurses engaged in self-directed learning as a response to the lack of organisational support. As a result, it was their individual attitudes and motivation which guaranteed effective level of services in the MG projects rather than organisational support. In effect, nurses were strongly motivated to move into their new roles because they wanted to help patients and their families. Thus, they viewed the MG project as a benefit rather than a cost. As such, they believed that their involvement was the most appropriate decision to take. Furthermore, the researcher found that nurses were genuinely interested in genetics and willing to share their knowledge across organisational and professional boundaries of their organisation. As such, nurses showed positive individual attitudes towards the MG projects.

Thus, the study is different than conventional studies on knowledge management studies which previously focused on organisational processes only as Foss noted. In this study, it is showed that individual antecedents can be important antecedents for facilitating knowledge sharing. Thus, the study is aligned with recent comments made about the need to focus on individual attitudes in future research projects on knowledge management rather than organisational antecedents (Currie *et al.*, 2008b; Foss *et al.*, 2010). In effect, commentators now suggest studies focus on individual involvement such as leadership to find antecedents that facilitate or inhibit knowledge

transfer in organisations. That is, the ability to share knowledge is mostly dependent on individuals' willingness to share knowledge and this often lacked in the generic KM literature. As such, as Currie pointed out in a discussion on knowledge transfer antecedents, individual involvement in knowledge transfer can fill the organisational gap in relation to knowledge transfer. However, such learning effort may not be rewarded effectively given the presence of professional boundaries between nurses and doctors.

7.2 Knowledge management methods

The study investigated common knowledge transfer methods such as education, training and development and their role in the MG projects.

Education focuses on skills, knowledge, and attitudes to be used in future work (Nadler and Wiggs, 1986). It was argued that education would facilitate knowledge transfer as individuals would become more knowledgeable about a specific set of skills, namely genetics.

In the study, the majority of nurses did not use education to acquire knowledge of genetics. Furthermore, the researcher noted that in cases where education was used, courses content often had no relevance to the MG project contexts; that is these courses were more general than specific in relation to genetics. Finally, the researcher noted that such courses were not often supported by their organisation as nurses often used personal resources to attend these courses. Thus, the study is consistent with previous studies that emphasised the lack of formal support within the nursing context (Dingwall & Allen, 2001; Pelletier, Donoghue, Duffield, Adams, & Brown, 1998;

Pelletier et al., 1994; Perry, 1995). In effect, studies often found that the NHS failed to support nurses. In the study, nurses expected such support. Formal education should not be treated as a luxury or a lifestyle choice as commentators argued (Perry, 1995). Rather, formal education provides credentials which the organisation can measure and evaluate for effective workforce planning.

In relation to development, the researcher found no evidence that genetics was used to support long-term career development. Rather, the study found that training, especially self-directed learning, was more likely to be used as it provided a short-term answer to the lack of organisational support for facilitating the sharing of genetics. In using self-directed learning, nurses often used their own resources and time. A typical pattern observed across cases was for nurses to gather information as an aide-memoire as well as train or observe genetic counsellors. In addition, it was found that self-directed learning was often used in combination with other knowledge transfer methods. Third, self-directed learning was often perceived to be a relevant method for acquiring both tacit and explicit knowledge as nurses often defined the concept in both ways.

Thus, the study supports the view that training can be an effective knowledge transfer method (Andrews *et al.*, 2000). In particular, self-directed learning was seen as an appropriate method for acquiring skills of genetics given the time and resource constraints nurses were faced with. The focus was on both tacit and explicit knowledge as nurses were interested in both the practice of doing genetics and the basic abstract theories of genetics. However, the study shows that such method inhibited transfer of knowledge beyond the scope of the MG projects. In particular, acquiring genetics knowledge helped nurses achieve the goals of their jobs. However,

the process of sharing knowledge to others was problematic since nurses were, in some cases, constrained by time and access to their colleagues. Thus, training was more relevant for acquiring knowledge than sharing knowledge across organisational and professional boundaries. Therefore, the study adds support to previous studies on the stickiness of knowledge (Brown *et al.*, 2001; Szulanski, 1996, 2000; Szulanski *et al.*, 2004; Szulanski *et al.*, 2006). The study also contributes to previous studies on knowledge transfer in public sector organisations (Addicott et al., 2006; Hartley & Benington, 2006; Rashman et al., 2005a; Rashman et al., 2002; Rashman et al., 2005b; Robertson et al., 2003a). In effect, knowledge transfer in public sector organisations tend to obey to different rules and norms than private sector based organisations. As a result, genetic models discussed in key KM ;publications can be critiqued because of their lack of consideration for the professionalised context of some of the most important public sector based organisations such as the NHS.

The study also contradicts the KM literature which tended to shift the responsibility of learning onto the individual as opposed to the organisation (Teece, 1998a, b, 2000a, b; Teece et al., 1997). In the study, knowledge was acquired through personal investment of time and resources but affected nurses' morale because there was no organisational support to acknowledge their investments in genetics.

A last point worth discussing is the role of tacit and explicit knowledge. In the study, tacit knowledge was mostly understood to be about practices while explicit knowledge was mainly concerned with readings about genetics as recommended by genetic counsellors and the like. Such distinction appeared to be useful to discriminate the nature of knowledge of genetics. However, this theme did not seem to be

important for nurses. Rather, the need to be able to use knowledge regardless of its nature was more important than the nature of knowledge itself. Therefore, the study showed that such discussion on the superiority of tacit knowledge may perhaps be less relevant to investigate in future KM studies. In particular, the need to know whether tacit knowledge is more valuable than explicit knowledge appears to be a non-issue in the minds of the nurses.

The use of self-directed learning also adds to an ongoing debate in medical sociology and nursing literatures: that of experiential learning in the nursing profession (Dingwall et al., 2001; Donoghue, Pelletier, Adams, & Duffield, 2002; Howard, 1993). In effect, two divergent views co-exist with each carrying a set of different implications for knowledge transfer. On one side, experiential learning is valuable and deserves more attention as the NHS is less likely to support its employees in terms of education leave and so on (Donoghue et al., 2002). On the other, experiential learning is not relevant to the professionalised context of the NHS and some suggested more attention be paid to formal education and credentials for enhancing nurses status vis-à-vis other occupations such as medicine (Dingwall *et al.*, 2001). Therefore, more contextual analyses are required to understand self-directed learning and whether credentials would improve the nursing profession status vis-à-vis other occupations such as medicine. In the study, self-directed learning was advantageous for existing practice. Yet, this method was not rewarded appropriately and did not improve career prospects. As a result, knowledge developed from self-directed learning inhibited individual and organisational knowledge transfer outcomes (Kamoche *et al.*, 1998). At an individual, nurses could not rely upon such knowledge to demonstrate competency in genetic counselling related job opportunities. At an organisational

level, nurses could not share knowledge with others. Thus, the organisation could not appropriate knowledge within existing formal mechanisms.

Overall, the study finds that knowledge is difficult to transfer across organisational boundaries of the MG projects. Organisational boundaries included lack of feedback and poorly designed HRM practices. Furthermore, structural change did not change existing interactions between professionals. The study noted, however, that individual antecedents improved knowledge transfer. As a result, the study found knowledge to be situated, local and, most importantly, sticky. Therefore, outcomes of knowledge sharing initiatives did not match policy-makers expectations.

7.3 Professional antecedents to genetics in the MG projects and existing literature

The study also investigated how professional antecedents affected knowledge transfer in the MG projects by investigating the role of genetics in the nursing profession. As discussed in chapter 2, analysing knowledge transfer in a professionalised context requires understanding issues of education, professional association impact and client differentiation. In doing so, researchers may learn about power differentials between professions and issues of jurisdiction and competition at inter and intra professional levels (Abbott, 1988; Freidson, 1970a, 1976a). Similarly, researchers may understand the role of professional institutions in supporting a specific set of skills such as genetics.

The study found that knowledge of genetics was not supported by key professional actors within the nursing profession. To that extent, the study supported previous studies conducted within the medical sociology field and public management literature that demonstrated that professions mediated the dissemination of knowledge (Ferlie *et al.*, 2005; Greenhalgh *et al.*, 2004; Lewis *et al.*, 1999; Newell *et al.*, 1995; Swan *et al.*, 1995; West *et al.*, 1999; Wood *et al.*, 2003). In particular, the study showed that knowledge of genetics was difficult to implement within the nursing educational system and that there was limited evidence of strong support at a nursing professional association level. In addition, the study found examples of client differentiation between nurses and doctors as well as genetic counsellors since nurses were given mundane tasks rather than important tasks as part of their roles in the MG projects. As a result, the researcher found that genetics was less likely to be supported in the nursing context. Therefore, the study found that professional antecedents inhibited the dissemination of knowledge of genetics in the nursing context.

The study found that genetics was not viewed as an important priority in nursing education. First, there was limited support for genetics within existing nursing curricula. Second, the lack of courses was detrimental to nurses on the project. Thus, the study is aligned with previous studies that highlighted a relationship between education and quality of care (Aiken, Clarke, Cheung, Sloane, & Silber, 2003; Burke & Kirk, 2006a; Burke, Stone, Bedward, Thomas, & Farndon, 2006b; Burke, 2004, 2005; Burke & Emery, 2002; Finlayson et al., 2002). The study also contradicted policy-makers vision on the important role of genetics in delivering better care to patients (Department of Health, 1997, 2000, 2001a, b, 2002, 2003a, b, 2004a, b, 2006a, b). In particular, the study shows that genetics is not a central topic in the

nursing educational system. As a result, the study is consistent with previous studies on the limited role of genetics in the existing nursing educational system (Boars *et al.*, 2005; Burke *et al.*, 2006a; Burke *et al.*, 2006b; Burke, 2004, 2005; Burke *et al.*, 2002). For Burke and Kirk (2006), this lack of recognition for genetics in nursing education is a problem given that the nursing profession has been exposed to genetics for more than 30 years as the authors argued. Among the key reasons oft-cited by Burke and Kirk on the slow spread of genetics within a nursing context are lack of time, educational staff shortages and limited funding. In the study, educators also cited these reasons to explain why genetics was not supported within their local university. As a result, findings show that genetics require more resources to be promoted successfully within nursing practice.

The study also found nursing professional association to be unsupportive of genetics. Both nurses and educators felt that the level of support from nursing professional associations was minimal. In addition, the study found that the boundary between nurses and genetic counsellors was reinforced as the AGNC introduced new registration rules requiring new entrants to possess qualifications such as an MSc degree in genetic counselling to register as a genetic counsellor. Consequently, the study supports previous research on the mediating role of professional associations in knowledge transfer. As with previous studies, professional associations create barriers for entering a profession as well as distinct knowledge bases as part of their need to overthrow competition (Addicott et al., 2006; Ferlie et al., 2005; Fitzgerald & Ferlie, 2000; Fitzgerald, Ferlie, Wood, & Hawkins, 2002; Newell et al., 1995; Swan, Newell, & Robertson, 1999; Swan et al., 1995).

As a result, the role of the professional association is of extreme importance should a set of skills be promoted in a profession. In the study, genetics was poorly disseminated because nursing professional associations did not promote and implement strong learning programs around genetics. In particular, the researcher was not told about accredited programmes that the nursing professional association would be promoting. Instead, the researcher found that existing learning programmes that were promoted by key nursing professional associations on genetics were often of limited impact from a professional boundary standpoint. That is, the existence of learning strategies such as internet-based solutions was not seen as creating opportunities for nurses to move across organisational and professional boundaries between them and the genetic counselling occupation.

Furthermore, nurses often felt no need to source knowledge from their nursing professional associations. This finding was in contradiction with data collected from a member of a leading nursing professional association. In effect, this member, whose role involves developing learning projects, argued that genetics was well supported and that the professional association was using all communication channels currently available to them, such as the internet, to provide courses on genetics. Such courses were available to nurses who wanted to learn more about genetics. Thus, there was view that learning depended on individual involvement rather than organisational or professional support. Such view was consistent with the generic KM literature that emphasised individual involvement in knowledge transfer. However, this view was inconsistent as the study showed that learning strategies centred on self-direct learning only had limited value and only worked for discrete activities such as the MG projects. Furthermore, the study found that such individual engagement could not

change existing professional boundaries. Thus, the study was consistent with the view that professional associations have a role to play in the dissemination of knowledge. In the study, the lack of involvement had a detrimental impact upon knowledge transfer of genetics.

The role of the AGNC is also another example supporting the view that professional associations mediate knowledge transfer. In the study, the need for genetic counsellors to be registered at the AGNC alongside the creation of an MSc in genetic counselling proves that more barriers to entry in the genetic counselling profession are being erected. This affected nurses on the MG projects in a most direct way because it nurses had to formally re-train to register as a genetic counsellor should they wanted to move into the profession of genetic counselling. This is somewhat ironic since most genetic counsellors interviewed as part of the study often had a nursing background before moving into genetic counselling. As a result, the study finds the role of a professional association to play an important role in facilitating knowledge transfer.

Client differentiation also played a significant role in the study. In particular, the use of nurses to provide genetic services to patients at a low risk level is a perfect example of how the genetic counselling profession and medical consultants distanced themselves from the nursing profession. Using a two tier structure, the MG projects are exemplar that knowledge transfer across professions is difficult since interesting cases are often taken care of by specialists rather than nurses. In this context, there was limited evidence that the nursing profession would threaten the existing relationship it developed with the medical profession over the last couple of centuries and newer occupations such as genetic counselling. Thus, this study supports the

general argument that professions engage in client differentiation tactics as an effort to undermine efforts from incumbents (Abbott, 1988). By delegating uninteresting cases to nurses, consultants and genetic counsellors remained powerful vis-à-vis nurses. Even though this differentiation does not represent a major risk for patients, it demonstrates that dissemination of genetics knowledge within the nursing profession is controlled by other professions, namely genetic counsellors and specialist consultants. As a result, findings show that the vision set out by policy-makers of moving healthcare to the frontline is not taking place in practice since professional boundaries exist between nurses and specialists. Instead, the MG projects contributed to reinforce the boundary between doctors, specialists and nurses by creating an organisational structure around client differentiation. That is, high risk levels patients would be treated by consultant specialists and low risk levels patients would be transferred to nurses. In short, there was no change in terms of team-based structure or allocation of tasks.

Such division of labour is a classic case of client differentiation as described in the medical sociology literature (Abbott, 1988). It is also consistent with Ferlie et al. study on the dissemination of innovation in professions (2005). Specifically, findings support the argument that knowledge management in a professionalised context is difficult to implement due to the presence of organisational and professional boundaries. These findings also indicate that there needs to be significant changes made to successfully disseminate genetics knowledge within the nursing profession. This is even more important given the fact that previous studies suggested that patients were comfortable with provision of genetics being located in primary care organisations (Burke, 2004; Emery & Hayflick, 2001). In effect, previous studies

found that patients were happy that genetic services were provided by nurses (Robins & Metcalfe, 2004). It is also important to address such issues given that other key actors of the primary care community, namely general practitioners, are not entirely aware and not necessarily willing to use genetics as part of their daily routines (Acheson, Stange, & Zyzanski, 2005; Baars, de Smit, Langendam, Ader, & ten Kate, 2003; Baars, Henneman, & ten Kate, 2005; McCann, Macauley, & Barnett, 2004; Pilnick & Dingwall, 2001; Watson, Shickle, Qureshi, Emery, & Austoker, 1999). In that respect, nurses represent ideal candidates to provide genetics services given their knowledge of genetics and their nursing backgrounds. Their ability to educate other professionals also represent significant advantages for the NHS as a whole (Shickle, Hapgood, & Qureshi, 2002). What is now required is perhaps changing organisational mechanisms so that nurses involvement is, at least, taken into account within the existing organisational structure of the NHS organisation.

Overall, genetics is not appropriately supported by key actors of the nursing profession. This poses significant challenges for realising the vision set out by policy-makers in the 2003 White Paper. Ultimately, such lack of consideration for improving conditions of learning about genetics in a nursing context is detrimental to nurses who end up with more knowledge and limited returns on such investment.

7.4 Chapter summary

This chapter examined findings of the study in relation to existing literature on knowledge management. The first section examined and discussed findings related to organisational antecedents and their role in the MG projects. The second section

discussed knowledge management processes used in the MG projects. The third section discussed professional antecedents that affected knowledge dissemination within the MG projects and the nursing profession. It was argued that findings support recent studies conducted in a similar environment (Currie *et al.*, 2008a; Currie *et al.*, 2008b).

Essentially, findings showed that HRM practices were lacking and that changing organisational structure did not improve existing organisational boundaries. It also showed that IT tools as well as evidence-based guidelines played a marginal role in the projects. The study also found that professional institutions did not support the dissemination of genetics within the MG projects and within the nursing profession as a whole. It also showed that significant work is required from both nursing educational institutions and nursing professional associations to support genetics in nursing. In addition, findings showed that nurses were still subordinated to the medical profession because nurses were in charge of mundane tasks whereas doctors were in charge of interesting cases exemplifying the notion of client differentiation as a tactic for controlling occupations.

Together, these findings contradict the generic KM literature and support recent critiques made on the relevance of such studies in the professionalised context of the NHS. Such contrast between the MG projects and the KM literature has implications for both theory and practice. This is discussed in the next chapter.

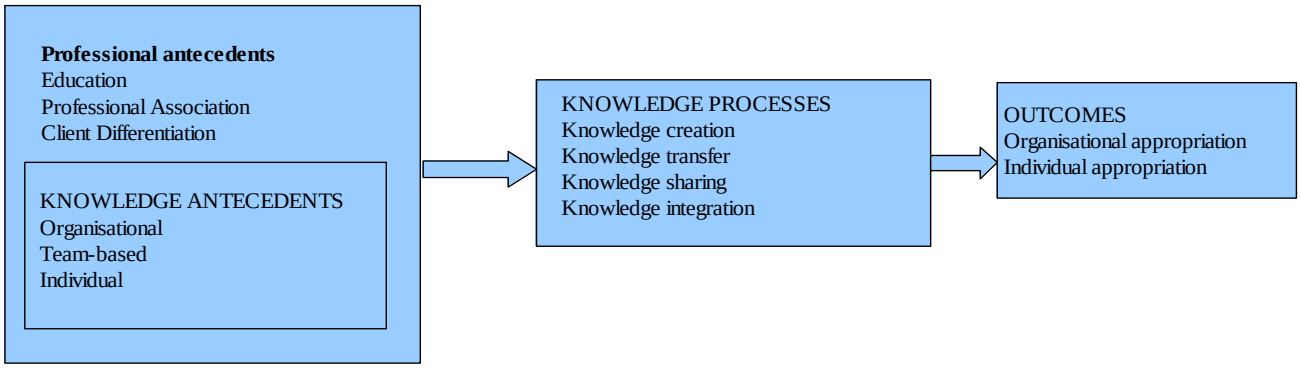
8 Chapter 8: Conclusion, implications for theory and practice

The study found that organisational and professional antecedents did not support knowledge transfer in the context of the MG projects. Organisational and professional boundaries inhibited knowledge transfer causing nurses to rely on self-directed learning. Hence, the study provided little empirical support to key ideas and concepts that currently exist in the generic KM literature. In particular, this study has shown that the professionalised context of the NHS is of a different nature than private-sector based organisations when it comes to management theories such as the KM literature. Essentially, theories of knowledge transfer centred on on-the-job-learning, use of flexible organisational structure such as network-based teams or autonomous teams or use of flatter career structure appear to be difficult to implement in a context such as the NHS. In such context, the existence of a professional hierarchy creates boundaries for knowledge to be shared. Professions regulate the production and creation of knowledge that changes aimed at disseminating knowledge outside such professionalised context would be difficult to implement. As the study shows, the impact of professional institutions is important in an organisation such as the NHS. Thus, this study has implications for theory and practice as explained below.

8.1 Implications for theory

Findings of the study have two kinds of implications for the current KM literature. First, concepts of the knowledge transfer as currently exposed in the knowledge management literature need to be refined. Second, the KM should investigate the argument that professions affect knowledge transfer in professionalised contexts in ways that current KM theories may not be able to deal with.

The knowledge management framework needs to be reviewed in light of current findings. The influence of professional antecedents in the NHS means that the theoretical framework of knowledge management outlined in chapter 2 (see page 28) should be changed as follows:



As the diagram illustrates, professional antecedents are positioned above organisational antecedents in the knowledge management framework to emphasise their influence on knowledge transfer in professionalised organisations. In effect, the context of the study provided an opportunity to understand the influence of professional power on knowledge transfer; a point which appears to be rather neglected in the generic KM literature. To better understand this idea, it is useful to

review the influence of education, professional association and client differentiation below.

In relation to professional education, the study showed that an educational system significantly impacted on knowledge transfer in professionalised contexts. As the study demonstrated, the role of universities in supporting and disseminating a specific set of skills in a profession is important should this profession seek to use such knowledge in practice. For instance, the study showed that support from universities could be essential in supporting professions acquiring new knowledge such as genetics. As interviews with educators showed, genetics was regarded as a low priority in nursing education. As a result, educators argued that genetics needed more resources to become an essential feature of nursing education and the nursing profession more generally. Thus, an educational system plays a role in knowledge transfer in a professionalised context. To date, no study in the KM literature attempted to investigate such issue. Yet, there is empirical evidence outside the KM literature suggesting that nursing education tends to play an important in nursing practice (Pelletier, Donoghue, & Duffield, 2003; Pelletier et al., 1998; Rognstad, 2002). One interesting avenue which may be of great help to researchers could be studies on career mobility (Dobrev, 2005). In particular, researchers in the KM literature could learn from longitidunal studies on career mobility that focus on alternative concepts such as the concept of flocking as described by Dobrev.

Similarly, the study found that on-the-job learning was perhaps of limited value for crossing organisational and professional boundaries because such learning method was not formally accredited by nursing professional associations adequately. As one

nurse remarked, there was no paper qualifications for it when discussing learning about genetics within the context of the MG project. As a result, learning did not benefit individual career prospects nor it benefited the organisation. Hence, researchers should broaden their lens of analysis and integrate the role of educational system in facilitating knowledge transfer in a particular occupation as well as studying knowledge transfer from within the organisation as well. Few studies investigated the above. For instance, studies such as Currie and Suhomlinova's study on knowledge sharing across boundaries between scientists and practitioners of the NHS are worth mentioning (Currie *et al.,* 2006a). Similarly, papers published on the evaluation of NHS genetics service investments by the research team which the researcher was part of are also relevant to include here (Currie *et al.,* 2009; Martin *et al.,* 2009). These studies also indicate that professions affect the provision of genetic services if one was to look to the issue of professional boundaries. More specifically, these studies indicate that the modernisation agenda proposed by policy-makers is less likely to be successful as removing or eroding professional boundaries is difficult to achieve. Professional boundaries whether inter-professional or intra-professional boundaries do have an impact upon knowledge creation and knowledge transfer in such context. Future studies could seek to replicate such logic.

The role of a professional association should also be included in the KM framework since the former can inhibit knowledge transfer as the study found. In effect, the researcher found little involvement from nursing professional associations to facilitate the sharing of genetic knowledge within the context of the MG projects but also within the nursing profession. Yet, professional associations actively shape knowledge production and knowledge transfer as the literature review argued. In the

medical sociology literature, such outcomes are well documented to the extent that researchers consistently emphasised the role of professional association as knowledge transfer gatekeepers (Dingwall, 1977, 1987, 1993, 1997; Freidson, 1976b; Jewson, 1976; Larkin, 1978). In effect, previous research stressed the important role of professional associations such as the British Medical Association in influencing policy reforms in the NHS (Armstrong, 2002; Tandeter & Granek-Catarivas, 2001). In the case of the nursing profession, studies also emphasised, to a lesser extent, the role of professional associations as important actors in knowledge transfer (Chua *et al.*, 1990). Studies from a public management literature also supported that view (Dopson, 2005, 2006; Dopson *et al.*, 2002; Dopson *et al.*, 2003; Ferlie *et al.*, 2005; Fitzgerald *et al.*, 2000; Fitzgerald *et al.*, 2002; Swan *et al.*, 1999; Swan *et al.*, 1995).

As a result, researchers willing to investigate knowledge transfer in professionalised contexts should pay attention to the impact of a professional association on knowledge transfer as well as paying attention to internal factors of an organisation. Professional associations mediate knowledge transfer because they regulate the provision of members of a profession through their registration system. In addition, professional associations mediate knowledge transfer by promoting innovation across its members base (Ferlie et al., 2005). Finally, professional associations create specific knowledge bases and specific skills which members of that said profession are required to possess to enter the profession. As a result, professional associations are important institutions for facilitating knowledge transfer within a profession. Future KM studies should therefore pay attention to their role and impact on knowledge transfer in professions when investigating professionalised organisations such as the NHS.

Client differentiation should also be included in a knowledge management framework since it can also affect knowledge transfer between professions. In the study, nurses performed routine genetic tasks as opposed interesting cases. In doing so, specialist consultants and genetic counsellors remained in control of genetic services whereas nurses were given uninteresting cases. At the same time, nurses were squeezing new tasks into their existing roles, often at a loss from a rewards and incentives standpoint. Hence, while the MG projects added value from a cost-effective perspective, they did not change the existing relationship between doctors and nurses as other studies highlighted (Martin *et al.*, 2009). Thus, these new services were not conducive for changing the current boundary between these two professions. Surprisingly, the study found that this issue did not matter to nurses who often preferred to view their involvement as a stretch to their existing nursing role rather than an opportunity to move into the genetic counselling occupation. In short, knowledge transfer in the MG projects was not altering the relationship between doctors and nurses.

Consequently, the study highlighted the need for future studies to consider the issue of client differentiation. In other words, researchers willing to investigate knowledge transfer in professionalised contexts should also pay attention to the relationship between professions to better understand their power differentials. In doing so, researchers can learn from the possible boundaries that exist between such professions and, at the same time, understand the reasons why specific forms of knowledge would be facilitated or inhibited in a particular context. Thus, client differentiation should be addressed in the KM literature because it reveals the dynamics of dominance between professions. As the sociology of professions literature suggested, professions

routinely seek to establish a monopolistic position over other occupations through demarcation strategies, State support and public opinion approval (Freidson, 1960). In doing so, professions try to regulate the division of labour between them and other occupations which, themselves, engage in similar differentiation strategies. Often, professions engage in settlement tactics to solve potential conflicts arising from competition with other occupations. For example, professions may engage in a process of client differentiation to parcel out professional practice. In doing so, professions may avoid an overt conflict but remain in a powerful position in the ecology of professions. The result of such settlement is indicative of the dynamics of control between occupations. For example, the MG roles represented an archetype of settlement strategy as doctors partitioned genetic services into discrete tasks; some interesting and others uninteresting or routine-based. In this context, doctors were able to subordinate the nursing profession by giving away low-risk levels patients to the latter while staying in charge of high-risk patients. In this division of labour, knowledge transferred to nurses was not sufficient to control the provision of genetic services. Rather, knowledge acquired only helped nurses achieve these routines tasks. Hence, the process of differentiation is relevant to include in a discussion on knowledge transfer because it helps understanding the professionalised context. In the generic KM literature, knowledge transfer is assumed to be interest-free and not subject to power differentials. In this study, knowledge transfer is not interest-free but dependent on occupations objectives.

The second major implication of the study is that KM research should be more concerned about power and cultural issues in investigating knowledge management in professionalised contexts. As the previous paragraph argued, professional power

affects knowledge transfer. More specifically, it is the power of doctors, consultant geneticists and to a lesser extent genetic counsellors which affect knowledge transfer. By power, the researcher means that professions (such as the nursing profession) are still subordinated to more powerful professions such as doctors. As a result, knowledge transfer is contested because it works against pre-existing, yet dynamic, professional values and systems (Hyde et al., 2005; Young et al., 2001). This issue has been highlighted in previous studies, notably in the sociology of professions literature (Marchington, Grimshaw, Rubery, & Willmott, 2005; Sanders et al., 2008).

In effect, healthcare is a heavily professionalised context with dominant professions controlling knowledge transfer between and across occupations (Mintzberg, 1979, 1995). In such context, knowledge transfer is a difficult process to change given that professions rely on knowledge to subordinate other occupations. As a result, policies aimed at changing the existing culture based on power relationships between professions may be perceived as a threat by dominant professions (Armstrong, 2002). For example, one could re-interpret the MG projects as a threat to the medical profession to the extent that it allowed nurses to acquire knowledge of genetics. As a response, the medical profession engaged in client differentiation to subordinate the nursing profession. Meanwhile, the genetic counselling reinforced entry and exit to the genetic counselling occupation by strengthening its requirements for obtaining a license to practise. In the end, nurses were not able to control the provision of genetic services since the medical profession controlled the provision of services for high-risk levels patients. Therefore, enacting the less-bounded role envisioned by policy-makers may have added little value to the nursing profession than anticipated in the 2003 White Paper. Such issue was also highlighted in previous studies (Sanders *et al.*, 2008).

This issue of power begs the question as to whether the concept of knowledge management ever applies to the context of the NHS. In effect, power differentials between doctors and nurses create conflicts which seem to be difficult to overcome given the self-interest of each profession in trying to control competition from within and outside the profession. Furthermore, professional roles are more institutionally-determined than other organisational roles. More specifically, changes in organisational structure may not be effective if no changes in ecology of professions take place. This implies that nurses may become more knowledgeable by using more knowledge of genetics. However, if there is limited professional support for it and strong inter-professional conflict, then such effort may be of limited value to the profession which then squeezes new knowledge into an ever-growing knowledge base. As a result, the challenge is not organisational but professional given that nurses may not be able to achieve their professional goals through such roles.

Findings do not imply that there is no room for improvement. Rather, they show that current knowledge transfer theories are less adapted to a professionalised context. In the context of the MG projects, nurses were able to provide an effective and often enjoyed the experience of doing do so from patient safety/patient care narratives. Nevertheless, notions of disseminating knowledge, crossing boundaries or blurring professional boundaries as promoted in modernisation policies were not materialised in such projects because these policies did not take into account the long history of relations that define professions within such system.

Overall, the study has implications for theory because it questions the existing KM literature. First, it questions existing KM theories on the need to move away from structural change to investigating HRM practices. Second, it calls for more

consideration to the professionalised context where knowledge transfer takes place. To do so, the researcher recommended that future research focuses on power relationships between professions.

8.2 Implications for practice

The study has several implications for managers and policy-makers. First, HRM practices should be reviewed to facilitate knowledge transfer. Even if knowledge remains professionally controlled, managers can trace knowledge and evaluate skills required for future work. For example, managers should consider reviewing their feedback mechanisms. The recent introduction of the Knowledge and Skills Framework can fill this gap.

Managers should also consider the role of line management and provide adequate training for line managers to provide adequate feedback to their employees. In addition, management should investigate the issue of having two managers as the study often found. For example, managers should implement a system capable of storing data on performances of nurses whether involved in a nursing role or in an autonomous role such as the MG project. In this way, evaluating performance could be stored regardless of the individual who assessed the nurse.

Rewards and incentives policies should be tailored to reflect nurses' involvement in discrete interventions such as the MG projects. In some cases, nurses lost a grade despite taking on new activities. Such problem caused low morale among some cases and could also lead to higher attrition rates among the nursing profession. For

instance, more funding could be allocated to reward nurses who move into these roles. Similarly, a certification program could be established to recognise participation in such projects, especially when topics such as genetics are said to become central to the future of healthcare.

Recruitment should be re-designed as to attract qualified individuals. Job descriptions should be clear to attract suitable candidates at a national level. In the MG projects, recruitment operated at a local level for the most part. Similarly, managers should focus on retention by securing funding beyond the scope of such projects. If further funding is not a possible option, managers should then provide references for nurses willing to stay in genetics. In addition, managers could seek support from universities to provide credentials when nurses move into such specific roles where little harmonisation of formal education exists across UK universities.

Managers should also re-adapt nursing career plans accordingly to take into account such projects. In the absence of the above, knowledge acquired in such projects may be lost at both individual and organisational levels.

Evidence-based guidelines should be given less attention if these are not used for clinical-decision making. Similarly, managers should spend less time investigating IT tools for facilitating knowledge transfer given that individuals do not necessarily make full use of such tools.

Implications for policy-makers are as follows. First, structural reforms that aim to change interactions at an inter-professional level need to be more reflexive and take

into account the deep-seated divisions that exist between professions. This implies that managerial theories such as the KM theories need to be adapted to the professionalised context. Such adaptation requires an understanding of the forces that control knowledge flows in the organisation.

Second, policy-makers should review modernisation policies aimed at changing career pathways so that lateral career moves such as moving into the MG projects are rewarded accordingly. In the context of the study, most nurses did not see their new roles as helping them move up the career ladder in nursing. Rather, there was a view that such roles were short-term stints outside a nursing career path or an interim thing as one nurse stated. Such view is not useful to address the issue of recruitment and retention policy-makers are often concerned with. Specifically, these new roles were not useful to provide tangible career routes for nurses.

Educational and professional support need to be taken into account and aligned accordingly to better support nurses within the NHS. For example, pilot projects such as the MG projects should be inserted into a nursing educational context should a nurse want to train as a genetic counsellor. Similarly, professional associations should be encouraged to support their members by way of providing a certification system for experiential learning.

All of the above implies that there needs to be more resources allocated to genetics than previously allocated in the 2003 White Paper. £50 million may represent a huge sum for some but, within the context of the NHS, this amount represents a drop in the

ocean. Yet, this sum represented the total amount of funding allocated to all of the MG projects.

8.3 Future research

There are limitations to this study worth mentioning. First, future research should investigate knowledge transfer across other professionalised contexts since this study investigated only one professionalised context and one profession: that of the NHS and the nursing profession. As a result, findings of the study are not generalisable back to every single occupation/profession that exists in industrialised economies. Rather, they report empirical evidence of only one specific context. Thus, future research could investigate other professionalised contexts. In particular, future research could investigate the legal profession in relation to knowledge transfer since little is known in such context (Beaverstock., 2004).

Second, and should researchers focus on the NHS, there is a need for more contextual studies on knowledge transfer in other occupations. For example, studies could investigate knowledge transfer at GP practices (Currie *et al.*, 2008a). Similarly, studies could investigate knowledge transfer in allied health professions to understand the professional dynamics that take place in such context. Given that there is a strong boundary between medical doctors and alternative medicine, it may well be that knowledge management processes aimed at disseminating knowledge across these boundaries may well fail in that respect (Colyer, 2004).

Third, studies on knowledge transfer could investigate other healthcare systems. In the study, the focus was on the NHS. It may well be that other healthcare systems in other parts of the world differ from the NHS. For instance, researchers could replicate the study within a French context for example. Given that healthcare systems are a major concern for most EU countries, such studies may help researchers and policy-makers understand the implications of using generic knowledge management theories (Legrand, 1987; van Langen, Birnie, Leschot, Bonsel, & Wilde, 2003).

Fourth, researchers could also investigate the context of healthcare at a cross-national level to find similarities and differences across countries on knowledge transfer. Such effort may help address knowledge gaps at EU policy level.

In relation to the theoretical framework, more contextual studies are required on individual antecedents to knowledge transfer. Such opportunities may not be always present in the NHS context. However, the need to understand the willingness to share knowledge may be useful to complete the theoretical framework.

Quantitative studies may also be relevant to provide a snapshot of knowledge transfer and career outcomes given that knowledge transfer is increasingly being used as a mean for improving career prospects. In particular, future studies could investigate the whether acquiring knowledge through multiple on-the-job learning experiences affect career and knowledge transfer on a random sample of nurses or other professionals.

Overall, the researcher pointed at some possible research avenues for future research on the topic of knowledge management. This is not to say that these avenues represent

all that need to be studied in relation to knowledge transfer and professionalised contexts. In effect, the theoretical framework of the study was used to provide some directions to the researcher. However, future studies could investigate knowledge transfer in a complete different theoretical framework. In particular, researchers could import other theoretical framework such as the theory of Actor-Network Theory to investigate the professionalised context of the NHS and the issue of knowledge transfer (Callon & Latour, 1981; Hull, 1999). Similarly, future research could replicate the study using models such as the concept of architectural and component knowledge which Finn and Waring used for investigating knowledge transfer in hospital operating theatres (Finn *et al.*, 2006).

8.4 Chapter summary

This chapter concludes the doctoral thesis of the researcher. It focused on two research questions:

- How do organisational antecedents affect knowledge transfer in a specific knowledge transfer initiative in the NHS?
- How do professional antecedents affect knowledge transfer in a specific knowledge transfer initiative in the NHS and in the nursing profession?

The study found that organisational antecedents inhibited knowledge transfer as currently explained in the existing knowledge management literature. The study also found that professional antecedents inhibited knowledge transfer in the context of the MG projects but also within the nursing profession. Essentially, the study found that

the existence of a professional hierarchy between doctors and nurses inhibited knowledge transfer.

The study is therefore useful for individuals willing to understand a professionalised context and knowledge transfer. It also provides an opportunity for policy-makers to reflect on current policies inspired by knowledge management theories. In effect, knowledge transfer is difficult to implement in a professionalised context because its scope is limited by a professional hierarchy which controls knowledge and members. As a result, one can ask whether knowledge management theory will ever be relevant to a professionalised context. If such theories are to be applied in this context, debates on changing the power differentials between professions and the organisation are more than required. So far, attention to these professional antecedents is scant in much of the policies that attempted at shift the balance of power between professions. Furthermore, knowledge management theorists should revise their contentions and assumptions onto which their theories often are based on. Most commonly, many of the key studies which influenced policy-makers departed from a vision where barriers to knowledge transfer do not exist or are superficial. Yet, a professionalised context is one where professions actively erect barriers to secure a monopolistic position within an ecology of professions. In such environment, knowledge is not interest-free nor subject to organisational forces since professions, just like guilds, often operate in a system on their own (Dingwall, 1997). Such consideration should be borne in mind for future policy-making seeking to blur the boundaries between professions. Overall, this study contributes to existing research by supporting the view that the knowledge management literature should pay attention to professionalised contexts such as the NHS.

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Appendices

Appendix 1: interviews request letter
Appendix 1a: Interview request letter (nurse)

Dear XXXX,

As part of my PhD at the Institute of Science and Society of the University of Nottingham, I am conducting a research project on organisational issues related to the Mainstreaming Genetics Initiative pilot projects. This work is a component of a larger external evaluation being carried out by Professor Graeme Currie and his team from the University of Nottingham, in which you and your colleagues have kindly participated.

In order to follow up on the analysis of the data collected, I would be grateful if you would agree to participate in another interview. There are a number of themes emerging from the initial data collected that we would like to explore in more detail. In particular, we would like to explore careers and learning within the nursing profession in the context of mainstreaming genetics. If you are willing to take part in another interview, please complete and return the attached consent form after you have read the participant information sheet. The latter gives an overview of the interview process.

The interview would be face-to-face, at a time and place convenient to you, and will last for about an hour. However, it can be shorter than this if you prefer. Since you have been directly involved in the pilot, your participation will be valuable and very much appreciated in understanding the issues at stake. With your consent, the interview will be recorded, but your name and other identifying personal information will not be used in reports and other publications. You can withdraw from the interview at any time, and retract or amend what you have said following the interview. If you are willing to be interviewed, please could you suggest some times and dates and a venue which would suit you. I am planning to conduct most of my interviews over the next few months. Many thanks for your time and help, I look forward to hearing from you.

Best wishes
Fabrice Williams
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http://www.nottingham.ac.uk/igbis/lookup/lookup_az.php?id=MjAx&page_var=personal

Appendix 1b: Interview request letter (educator)

Dear XXXX,

As part of my PhD at the Institute of Science and Society of the University of Nottingham, I am conducting a research project on organisational issues related to the Mainstreaming Genetics Initiative pilot projects emanating from the 2003 White Paper 'Our Inheritance, Our Future - Realising the potential of genetics in the NHS. More specifically, my work involves investigating nurses' career developments in relation to learning. This work is a component of a larger external evaluation being carried out by Professor Graeme Currie and his team from the University of Nottingham. This project was commissioned by the Department of Health to understand the impact of the implementation of genetics within primary care environments.

In that respect, my work involves interviewing key stakeholders that have an input in shape nurses' careers such as educators. Therefore, universities and nursing departments represent valuable sources of information that can strengthen the depth and relevance of my research. Pre-registration and post-registration courses play an active role in determining nurses' career and it would be valuable to gather your views of the implementation of recent change programmes in relation to nurses' careers and around genetics specifically as part of this wider change.

If you are willing to take part in an interview, find attached an information sheet detailing the interview process. The interview would be face-to-face, at a time and place convenient to you, and will last for about an hour. However, it can be shorter than this if you prefer. With your consent, the interview will be recorded, but your name and other identifying personal information will not be used in reports and other publications. You can withdraw from the interview at any time, and retract or amend what you have said following the interview. If you have any questions, please do not hesitate to contact me. If you are willing to be interviewed, please could you suggest some times and dates and a venue which would suit you. I am planning to conduct most of my interviews over the next few months. In case you may not able to be interviewed, I would be grateful if you could suggest a colleague of your department that may be willing to be approached.

Best Regards,

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Appendix 1c: Interview request letter (genetic counsellors)

Dear XXXX,

As part of my PhD at the Institute of Science and Society of the University of Nottingham, I am conducting a research project on organisational issues related to the Mainstreaming Genetics Initiative pilot projects. This work is a component of a larger external evaluation being carried out by Professor Graeme Currie and his team from the University of Nottingham, in which you and your colleagues have kindly participated.

In order to follow up on the analysis of the data collected, I would be grateful if you would agree to participate in another interview. There are a number of themes emerging from the initial data collected that we would like to explore in more detail. In particular, we would like to explore careers and learning within the nursing profession in the context of mainstreaming genetics. If you are willing to take part in another interview, please complete and return the attached consent form after you have read the participant information sheet. The latter gives an overview of the interview process.

The interview would be face-to-face, at a time and place convenient to you, and will last for about an hour. However, it can be shorter than this if you prefer. Since you have been directly involved in the pilot, your participation will be valuable and very much appreciated in understanding the issues at stake. With your consent, the interview will be recorded, but your name and other identifying personal information will not be used in reports and other publications. You can withdraw from the interview at any time, and retract or amend what you have said following the interview. If you have any questions, please do not hesitate to contact me. If you are willing to be interviewed, please could you suggest some times and dates and a venue which would suit you. I am planning to conduct most of my interviews over the next few months. Many thanks for your time and help, I look forward to hearing from you.

Best wishes,
Fabrice Williams
Doctorate candidate, Institute for Science and Society (ISS) Room B107,
West Wing Law and Social Sciences Building The University of Nottingham
Nottingham NG7 2RD
Tel: +44 (0) 115 84 67 308
Fax +44 (0) 115 84 66 349
Email lqxfw2@nottingham.ac.uk
Web page:http://www.nottingham.ac.uk/igbis/lookup/lookup_az.php?id=MjAx&page_var=personal

Appendix 1d: Interview request letter (nursing professional associations)

Dear XXXX,

As part of my PhD at the Institute of Science and Society of the University of Nottingham, I am conducting a research project on organisational issues related to the Mainstreaming Genetics Initiative pilot projects emanating from the 2003 White Paper 'Our Inheritance, Our Future – Realising the potential of genetics in the NHS. More specifically, my work involves investigating nurses' career developments in relation to learning. This work is a component of a larger external evaluation being carried out by Professor Graeme Currie and his team from the University of Nottingham. This project was commissioned by the Department of Health to understand the impact of the implementation of genetics within primary care environments.
In that respect, my work involves interviewing key stakeholders that have an input in shape nurses' careers such as educators. Therefore, professional institutions such the Royal College of Nursing represent valuable sources of information that can strengthen the depth and relevance of my research. Active participation of professional institutions play an active role in determining nurses' career and it would be valuable to gather your views of the implementation of recent change programmes in relation to nurses' careers and around genetics specifically as part of this wider change.

If you are willing to take part in an interview, find attached an information sheet detailing the interview process. The interview would be face-to-face, at a time and place convenient to you, and will last for about an hour. However, it can be shorter than this if you prefer. With your consent, the interview will be recorded, but your name and other identifying personal information will not be used in reports and other publications. You can withdraw from the interview at any time, and retract or amend what you have said following the interview. If you have any questions, please do not hesitate to contact me. If you are willing to be interviewed, please could you suggest some times and dates and a venue which would suit you. I am planning to conduct most of my interviews over the next two months. In case you may not able to be interviewed, I would be grateful if you could suggest a colleague of your department that may be willing to be approached for a possible interview.

Best Regards,

Fabrice Williams
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Webpage:http://www.nottingham.ac.uk/igbis/lookup/lookup_az.php?id=MjAx&page_var=personal

Appendix 2: Consent forms

The University of Nottingham

Title of project:

Evaluation of NHS pilot genetics services

Name of researcher:

Please initial box

1. I confirm that I have read and understand the information sheet dated 25/08/2005 (version 2) for the above study and have had the opportunity to ask questions. ☐

2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, without my legal rights or involvement with the service being affected. ☐

3. I give consent for my interview(s) to be audio-taped as set out in the information sheet. ☐

4. I give consent for direct quotations from my interview(s) to be used in written outputs from the study. ☐

5. I agree to take part in the above study. ☐

Name of participant	Date	Signature
Name of person taking consent (if different from researcher)	Date	Signature
Name of researcher	Date	Signature

One copy for participant; one for researcher

Appendix 3: Participation information sheet

The University of Nottingham

You are being invited to take part in a research study. Before you decide, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like information. Take time to decide whether or not you wish to take part.

Thank you for reading this.

1. What is the purpose of the study?

Pilot genetics services currently being tried out in the National Health Service, such as the one with which you are involved, mean significant changes to the ways in which health services are managed and delivered. They may involve, for example, bringing together the skills and expertise of different professionals within the NHS or reorganizing services and the ways patients access them. This study, which will follow the pilot phases of these services for two to three years, aims to examine what facilitates and impedes such service reorganization, with a view to learning lessons about the challenges posed by strategic and operational changes within the NHS and the public sector more generally.

2. Why have I been chosen?

The researchers, in consultation with service leads, have identified the key posts involved in the service, including clinicians, managers, commissioners, service user representatives and others. Due to your part in the development, running and/or management of the service, you have been identified by the service lead as someone whose perspective and knowledge is important for the research, and you have agreed for the researchers to be given your details in order to contact you.

3. Do I have to take part?

It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time and without giving a reason. A decision to withdraw at any time, or a decision not to take part, will not affect your employment or any other rights if you are employed on the service, and will not affect your involvement with the service or any other organizations involved.

4. What will happen to me if I take part?

You will be asked to participate in a number of audio-taped, one-to-one interviews with a member of the research team from Nottingham University. These will relate to various issues around the planning, running and development of the service with which you are involved. These interviews will take place at various points over the next two to three years, depending on the timescale of the pilot period of the service.

5. What do I have to do?

The first interview will take place in the next few months, and will discuss issues in the development of the service up until now. After that, the researchers may wish to

interview you again, either to discuss particular issues you raised in the first interview, or towards the end of the service pilot to reflect on how the issues faced by the service changed over time. It is likely that we would like to interview a participant an average of two to three times, with each interview lasting between 60 and 90 minutes. Even if you have been interviewed once, you are under no obligation to be interviewed again. Any travel expenses you incur in taking part in the study will be reimbursed.

6.What are the possible disadvantages and risks of taking part?

We will be taking up some of your work time if you are employed in relation to the service, or some of your personal time if your are involved with the service on a voluntary basis. We do not, however, envisage any particular risks of taking part: given the nature of the interviews we do not expect to cover sensitive or personal areas. We will make every effort to use any direct quotations from the interviews in a non-attributable way, by removing any references which we think might identify you as an individual. You are free to withdraw or amend anything you have said in the interview, or to change your mind about being involved in the research altogether, at any time.

7. What are the possible benefits of taking part?

There will be no direct personal benefit for you, but your contribution will be used in research which will contribute to future policy and management in the NHS in general, in reorganizing genetics services in particular, and, possibly, in the service in which you are involved specifically.

8. What if something goes wrong?

If you are harmed by taking part in this research project, there are no special compensation arrangements. If you are harmed due to someone's negligence, then you may have grounds for a legal action but you may have to pay for it. Regardless of this, if you wish to complain, or have any concerns about any aspect of the way you have been approached or treated during the course of this study, the normal National Health Service complaints mechanisms should be available to you.

9. Will my taking part in this study be kept confidential?

All information which is collected about you during the course of the research will be kept strictly confidential. Any information relating to you, such as interview transcripts, will have your name removed so that you cannot be recognized from it. In any reports, publications or other documents from the study, we will make every effort to use anything that you say in the interviews in a non-attributable way, so that your identity is not revealed. Similarly what you say will not be divulged to anyone outside the research team, including others involved in your service, and we will not use your name or other personal details, or the name of your service, in disseminating the research.

10. What will happen to the results of the research study?

The findings of the research will be presented to the funder of the study, the Department of Health, through a report and presentations, and that report will also be made available to individual services, and to individual participants if they request it. Findings will also be published in academic journals and other publications. Early findings are likely to be published within a couple of years; the report to the funder is due in 2008; further findings are likely to be published beyond that date.

11. Who is organizing and funding the research?

The research is being funded by the United Kingdom Department of Health, and carried out by researchers at the University of Nottingham.

12. What if I have any concerns?

If you have any concerns or other questions about this study or the way it has been carried out, you should contact the investigator (Graeme Currie – details below), or you may contact the hospital/PCT complaints department.

Thank you for reading this information sheet, and for considering taking part in this study. If you decide you would like to take part in the research, you will be given a consent form to sign indicating that you have read and understood this sheet, and understand what will happen. You will be given a copy of that consent form and a copy of this sheet to keep.

If you would like further information on the study, please contact the Chief Investigator:

Graeme Currie

Institute for the Study of Genetics, Biorisks and Society

University of Nottingham

Law and Social Sciences Building

Nottingham

NG7 2RD

Telephone 0115 846 8152

E-mail graeme.currie@nottingham.ac.uk

Appendix 4: Interview schedule (Nurses)

INTERVIEW SCHEDULE DRAFT

SECTION 1: BACKGROUND INFORMATION AND PREVIOUS ROLES

Can you tell me more about your current responsibilities at your organisation?
Can you tell me more about your previous roles and how it started?
In terms of organisational grades, how did your career change?
What were your personal expectations towards the MG projects?
Did you expect your career to change with knowledge of genetics?

SECTION 2: KNOWLEDGE SHARING AND BOUNDARIES OF KNOWLEDGE SHARING HOW DID YOU LEARN ABOUT GENETICS?

Could you tell more about your nursing education?
Could you tell me more about the training you received in the projects?
Was this previous knowledge accumulated through these years relevant for the project? And why?
What were the skills your project required for you to learn?
How did your knowledge of genetics come about in this project?
Who did you learn the most from in the project?
Did you encounter any problems for acquiring knowledge of genetics? If so, why?
Did you encounter issues with other professionals or other departments working on the MG project? If so, why?
What were the other forms did you undertake for keeping abreast of genetics knowledge? (external courses, on-the-job training, work as it comes)
Did you refer to national guidelines for implementing MG projects into an integrated service? Where these guidelines useful? If so, why?
Did you refer to any of the following nursing professional associations for learning on genetics?

- The RCN
- The NMC
- Or any you may think of

If not, why did you not contact them?
Did they contact you? In your opinion, did they about the project?
Did you have clear lines of authority for this project? (line manager, project manager, etc.). If not, why?

SECTION 3: KNOWLEDGE AND CAREER PATHWAYS

Have the MG projects been useful for your career? If so, why and what ways ? If not, why?
In terms of skills, competencies or knowledge developed, do you feel genetics can be used in your next role? If so, in what ways? If not, why?
Do you think this project has been useful for getting another job?
Can you tell me what about your future plans and you plan to achieve them?
In terms of career progression, have the MG projects been useful for moving onto a better role? If sot, why and what ways? If not, why?
Or did you think this project provided you with more opportunities to do different jobs around ? If so, why and what ways? If not, why?

Appendix 5: Interview schedule (educators)

SECTION 1: BACKGROUND INFORMATION AND NURSING GENETIC EDUCATION

Can you tell me more about your career pathway?
Can you tell me more about current responsibilities at your organisation?

SECTION 2: LEVEL OF GENETICS KNOWLEDGE PROVIDED TO NURSES IN THEIR UNIVERSITIES AND MORE GENERALLY IN NURSING CURRICULA

What is the role of genetics in nursing education at your university and in general?
Do you think genetics is a priority in nursing education at the moment? If so why?

SECTION 3: POTENTIAL PITFALLS ASSOCIATED WITH ACQUIRING GENETICS KNOWLEDGE FOR NURSES FROM A CAREER VIEWPOINT.

What are your views towards the MG projects?
What, in your views, are the key skills or knowledge nurses can take away with projects such as the MG projects?
Did you think nurses could encounter problems for acquiring knowledge of genetics? If so, why?
Did you think nurses could encounter issues with other professionals or other departments working on the MG project? If so, why?
Did you expect their careers to change with knowledge of genetics? If so, why? If not, why?
What were, in your views, the other ways for keeping abreast of genetics knowledge would be effective for improving careers of nurses? (external courses, on-the-job training)
What are your views towards the role of nursing professional associations in nursing, especially regarding genetics?
Can genetics, in your view, help nurses become more versatile and move across specialities or even become a genetic counsellor? If so, why? If not, why?
Do you think the MG projects can have value for improving careers of nurses?
What benefits would you see nurses taking away at an organisational level with such project?

Appendix 6: Interview schedule (genetic counsellors)

SECTION 1: BACKGROUND INFORMATION

Can you tell me more about current responsibilities at your organisation?
Can you tell me more about your career pathway prior your existing role?
What was your involvement in the MG projects?
What were your personal expectations towards the MG projects?
Did you expect your career to change with the MG projects?

SECTION 2: VIEWS ON NURSES CROSSING ORGATIONAL AND PROFESSIONAL BOUNDARIES

Did you think nurses could encounter problems for acquiring knowledge of genetics? If so, why?
IN your views, what are the potential challenges associated with doing the role of a genetic counsellor in the MG project?
Did you think nurses could encounter issues with other professionals or other departments working on the MG project? If so, why?
What are your views towards the role of nursing professional associations in nursing, especially regarding MG projects?
Should there be more involved in providing educational support to their members and nurses at large?

SECTION 3: RESPONSES OF NURSES WHEN FACED WITH CROSSING ORGANISATIONAL AND PROFESSIONAL BOUNDARIES.

What, in your views, are the key skills or knowledge nurses can take away with projects such as the MG projects?
What benefits would you see nurses taking away at an organisational level with such project?
Can genetics, in your view, help nurses become more versatile and move across specialities or even become a genetic counsellor? If so, why? If not, why?
What are, in your views, other ways for keeping abreast of genetics knowledge would be effective for improving careers of nurses? (external courses, on-the-job training)
How do you think nurses can acquire knowledge of genetics if there
Do you think the MG projects can have value for improving careers of nurses?
Did you expect their careers to change with knowledge of genetics? If so, why? If not, why?
What would you say are the possible feelings of nurses who cannot move into a genetic counselling role? And why so in your views?

Appendix 7: Interview schedule (nursing professional association)

SECTION 1: BACKGROUND INFORMATION

Can you tell me more about current responsibilities at your organisation?
Can you tell me more about your career pathway prior your existing role?
What was your involvement in the MG projects?
What were your personal expectations towards the MG projects?
Did you expect your career to change with the MG projects?

SECTION 2: VIEWS ON NURSES CROSSING ORGATIONAL AND PROFESSIONAL BOUNDARIES

Did you think nurses could encounter problems for acquiring knowledge of genetics? If so, why?
IN your views, what are the potential challenges associated with doing the role of a genetic counsellor in the MG project?
Did you think nurses could encounter issues with other professionals or other departments working on the MG project? If so, why?
What are your views towards the role of nursing professional associations in nursing, especially regarding MG projects?
Should there be more involved in providing educational support to their members and nurses at large?

SECTION 3: RESPONSES OF NURSES WHEN FACED WITH CROSSING ORGANISATIONAL AND PROFESSIONAL BOUNDARIES.

What, in your views, are the key skills or knowledge nurses can take away with projects such as the MG projects?
What benefits would you see nurses taking away at an organisational level with such project?
Can genetics, in your view, help nurses become more versatile and move across specialities or even become a genetic counsellor? If so, why? If not, why?
What are, in your views, other ways for keeping abreast of genetics knowledge would be effective for improving careers of nurses? (external courses, on-the-job training)
How do you think nurses can acquire knowledge of genetics if there
Do you think the MG projects can have value for improving careers of nurses?
Did you expect their careers to change with knowledge of genetics? If so, why? If not, why?
What would you say are the possible feelings of nurses who cannot move into a genetic counselling role? And why so in your views?

Appendix 8: Email Survey questionnaire (Nurses)

DATE

Dear XXXX,

I would like to thank you for your participation in the mainstreaming genetics project last year. I am nearing completion of the project, and thanks to your input, have generated valuable and interesting findings which will allow a better understanding of the context in which nursing careers are currently evolving, to be gained.

In order to finalise the project, I would be grateful if you were able to answer a few more questions. These questions respond to issues that have arisen from the data analysis, and should take no more than ten to fifteen minutes of your time to answer. The questions all ask about your career following the mainstreaming genetics projects.

I would be very grateful if you were able to do this, and return the responses to me via email. My email address is: lbxfw@nottingham.ac.uk.

Section 1: Please answer the questions in this section if you are still employed or involved in the Mainstreaming Genetics Project. If not, please skip to either section 2 or 3 accordingly.

Question 1:
Have your responsibilities have changed at all since I last spoke with you? If so, please elaborate upon how they have changed.

Question 2:
Since your participation in the MG project, have your new skills and knowledge been formally recognised and documented as part of the Knowledge Skills Framework/formal review/competencies portfolio? If so, please elaborate on how genetic knowledge and information helped in your review process.

Question 3:

Have you gained or lost an occupational grading following your participation in the Mainstreaming Genetics Project? If so, please elaborate on the reasons as to why the above occurred?

Question 4:
Have you undertaken any university accredited training for certifying new genetic knowledge and information? If so, please elaborate on this process and whether this was supported by the NHS? If not, please elaborate on the reasons as to why this has not been the case?

Section 2: Please answer this section if you have returned to your previous role upon completion of the Mainstreaming Genetics project. If this is not the case, please skip to section 3.

Question 5:
Please provide details about your previous role?

Question 6:
Upon your return to this role, have there been any changes? For example, are your responsibilities the same as they were before the project commenced, has your organisational grading changed?

Question 7:
Do you think that the new knowledge of genetics service (gained from the Mainstreaming Genetics initiative) has been used appropriately away from the projects? Has it been included in your competencies portfolio and in any formal review?

Question 8:
Have you undertaken any university accredited training for certifying new genetic knowledge and information since we last spoke? If so, please elaborate on this process and tell us whether this was supported by the NHS? If not, please elaborate on the reasons as to why this has not been the case?

Section 3: Please answer this section if you have moved onto a new role following the Mainstreaming Genetics Project

Question 9:
Please tell me more about your new job and the responsibilities that you have.

Question 10:
Do you think that your new knowledge of genetics contributed significantly to your recruitment in any new role that you might have had? If not, why do you think this might have been the case?

Question 11:
Do you use genetic knowledge and information on a daily basis in your new job? If so, how important is genetics in your new role and to what extent? If not, why not?

Please return your responses to lbxfw@nottingham.ac.uk

Many thanks for completing this short follow-up questionnaire, and once again for your support with this project.